AMERICAN DYESTUFF REPORTER

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the revision of the patent laws is a very weighty question, for which no one has given an entirely satisfactory answer so far. It makes no difference how we may be defeated and if every other breach is closed without paying sufficient attention to the question of patents our other work will have been in vain.

It was suggested, in reference to the tariff law, that everyone try to figure how they could evade the law in case they were foreigners with such intention and then send their scheme to the Board of Tariff Revision so the necessary precautions could be taken. This would work equally well with the question of patents but unfortunately there is no Board of Patent revision to take care of the matter. That does not prevent anyone from thinking out a plan and submitting it to the new association and, if practical, it will not be difficult to bring it to the attention of the proper department in Washington.

This concerted action in all matters cannot fail to accomplish more than the disunited efforts of individuals and on the same principle the matters dealt with must be those of wide scope and general interest without consuming time and effort on affairs affecting individuals only.

The dealers feel that they should figure more prominently in the organization, as it is they who come into actual contact with the consumer. They are the ones in the first line trenches and on whom it is depended to do the real work of distribution. With the larger houses the factory element is usually quite distinct from the selling organization, and we fail to see any real distinction between the sales department of a manufacturing company and an independent dealer handling the goods of another manufacturer.

Fortunately, provision has been made for representation of the associate membership on certain committees, and their wishes will at least be known.

Generally it is the consumer, aided by the representative of the selling company, whose demands for better goods improve the quality of the manufactured product or rather force the improvement. The products of any manufacturer are generally improved when competition forces such a change or when the sales force demands it. The consumer, dealer or salesman cannot be ignored. They always have been and will continue to be the greatest factors on the side of progress, and we earnestly hope that in the new association the leaders will recognize these facts.

Latest Developments in American Dyestuffs

Many American factories are now experimenting with Rhodamine B, and it is predicted that we soon shall see it on the market. With a price around $60 per lb. for the concentrated type this is certainly an attractive field, but the entrance of several makers into competition will doubtless lower the price.

Official Report of Convention of American Dyestuff Manufacturers

(*Continued from last week*)

Address of Mr. H. Gardner McKerrow

Mr. Chairman, Gentlemen of the Convention: When the suggestion was first made that the dyestuff manufacturers and dealers of this country should be invited to take part in this convention, the central idea which prompted the move was that of the advisability of devising some means for the standardization of American dyes.

As the preparations for this meeting progressed, however, the initial idea expanded considerably until it became apparent that the first and most advisable step to be taken was to form a commercial association representing the dyestuff industry as a whole, and having under its care and jurisdiction not only the question of standardization, but other collateral questions of equally great importance to the industry, such as questions of tariff patent law as affecting the dyestuff industry, arbitration of disputes, protection of contracts and other matters which, as the new industry becomes of more and more importance, call for treatment of an authoritative nature in the interests of all rather than the individualistic attention from diverse and divided interests which is all that such questions have received hitherto.

This, therefore, gentlemen, will be the first matter to be brought to your attention, the question as to whether we shall form a National Dyestuffs Association, and if so, the form it shall take, the duties it shall assume and the character of its government. It would appear that the right time to effect such a central organization is during the infancy of the industry, for it is then that the interests of all factors, both large and small, can be most equitably safeguarded and that the fundamental basis of its ultimate control can be established under such conditions as will best adjust themselves automatically to whatever its future growth may be.

As regards standardization, no very definite conception as to how this could best be done was available at that time, but as the responses to the original invitation were almost without exception of an approving, and even an enthusiastic nature, and as they came from a very large proportion of those actively engaged in the industry, the idea began to take shape, and a great deal of expression of opinion took place; many experts in the dyestuff business were consulted; and others who had been identified with questions of standardization in other lines of industry were asked for their ideas.

While the general idea of standardization was almost universally admitted to be something which it was eminently desirable to accomplish, a considerable conflict of opinion developed. By some it was characterized as an "iridescent dream," an ideal which is too far beyond our reach to attain; by others as a proposal which led to such complications and difficulties as to make it impossible of practical fulfilment; and still others did not hesitate to say that it was perfectly feasible and could be developed and carried out on perfectly proper and scientific lines if it was approached with an open mind and in a proper spirit.

The opposition to it may be roughly classified as of three kinds,—first that of the man who honestly believes that it cannot be done, and in this regard I would remind you gentlemen, that it certainly was done by the German dyestuff manufacturers, and if it could be done by them, there is no conceivable reason why it cannot be done by American manufacturers. We have at the present time a complete list of probably less than one hundred aniline colors made in this country and these are for the most part of well recognized standard types, whereas it must be remembered that the standardization of German dyes included a line of upwards of one thousand colors, including not only distinct homogenous colors in themselves but a vast variety of compounds and mixtures and shades. It would not seem to be impossible, therefore, that at this stage of the development of the industry some ef-

fective means of laying the foundations for a system of standardization could be accomplished which would adjust itself to the future growth of the industry.

It is not suggested that in establishing such a line of standards under the authorization of the National Association that the very highest types and strengths of colors produced should be adopted, to which all manufacturers would be expected to conform, but that an average, working standard, which would be within the reach of all manufacturers honestly endeavoring to produce reliable goods, should be devised. It is quite possible that some offerings may run ten or even twenty per cent. higher than this standard, in which case the material offered would be worth relatively more money,while other offerings might be ten or twenty per cent. below the standard, in which case the manufacturer would be entitled to the value represented by his material or would be impelled to improve his method of production so as to reach the trade standard.

It is to be borne in mind further that it is practically indispensable to the purposes of the United States Government that some form of standardization should be adopted for the purposes of assessing and levying duties on imported colors.

Wherever this duty takes the form of a specific rate, that is to say an impost of so much per pound, the question of the degree of concentration is immediately raised. There must be a starting point which the Government can adopt and against which importations can be compared for the purpose of determining the degree of concentration. It has been shown by past experience that dyestuffs can be imported of four and five times the concentration of ordinary recognized trade standards, and yet these importations carry no higher specific rate per pound than the trade standards as recognized before the war, thus defeating a very large proportion of the protective intent of the act. It is certain that if the dyestuff industry does not devise some means of standardization which the Government can adopt, an attempt to do this will be made by the Bureau of Standards in Washington. Would it not be far better, therefore, for the industry to devise a method of standardization which will be satisfactory to the Government, which will protect the interests of the dyestuff manufacturers and dealers, and which will, at the same time, also protect the interests of the consumers of dyestuffs, rather than leave it entirely to the functions of the Bureau of Standards, which would necessarily act in a more or less arbitrary way and simply with a view to facilitating the assessment of duties on imported dyes?

Another species of opposition to the question of standardization has been from the purely technical interests in contradistinction to the practical interests. These gentlemen seem to be opposed to the idea chiefly on the ground that it has never been done hitherto and therefore that it is not amenable to accomplishment. This is the kind of opposition which inevitably

confronts all new movements of this kind, and which can be safely left to take its proper place in the final consideration of the question.

A much more dangerous and insidious opposition is that of those elements which seem to think that it is not to their interest to see any method of standardization adopted for American dyestuffs. Whether this is actuated by a belief that they themselves will establish and provide a standard to which all other makers will be compelled to align themselves or go out of business, or whether they have even more ulterior motives, and have an unexpressed idea of keeping the American dyestuff industry in a chaotic and confused condition and thus render it a fertile field for re-exploitation in the interests of the German dyestuff manufacturers when normal conditions are restored, is a question that should be carefully considered and guarded against.

Whether it is feasible or not to establish a method of standardization on the outline suggested is entirely in the hands of you gentlemen to determine.

There is one thing, however, that can be accomplished. Such a Bureau of Standardization as might become one of the influential factors in the new dyestuff organization could effectively operate at least as a bureau of which I will call, for the want of a better term, registration. To it could be submitted types of the colors made by the American dyestuff makers as representing the standards which they propose to follow. These could be definitely tabulated and filed, and any consumer purchasing dyestuffs represented to be offered under the scale of standards adopted by the National Association would have the right to submit a sample of the delivery made for authoritative comparison with the original type standard as offered by the maker in the registry of the bureau. If the delivery should prove to be inferior to the type sample, it would be within the province of the Bureau of Standardization to call the attention of the manufacturer to that fact so that he might have an opportunity to correct his process and to make such allowance as would be proper to the consumer who had received the delivery, something which all reputable manufacturers would gladly seize an opportunity of doing. If, however, there should be a maker of dyestuffs who persistently made inferior deliveries and who refused to be bound by the original type deposited with the Bureau of Standardization, it would then be within the province of the National Association to expel such a maker from membership, and to cause him to lose his standard before the dyestuff consuming public.

This would in itself tend to eliminate the dishonest manufacturer and dealer, and it would overcome the evil from which the industry has suffered as regards inferior export deliveries which during the past year has done more to injure the reputation of American dyestuffs in foreign countries than any other one thing.

It is suggested that a copyrighted name and insignia should be adopted which all members of the association in good standing shall be entitled to use on their letterheads, billheads, on their advertisements, or elsewhere, which shall be a badge of quality and which will so come to be regarded by the consumer.

This is all that I need to say in the way of suggestion on the question of standardization, and I can safely leave it to you gentlemen to offer such suggestions as may occur to you, based on your own experience, with a view to devising some proper means for evolving a method of procedure which is universally recognized to be a desirable, and even an indispensable thing, with a view to the permanent establishment of our industry as an asset in American industrial life.

On the question of arbitration, this again is something which is essentially collateral to the question of standardization. Our courts have been congested with disputed cases during the past three years, practically all of them based on claims that deliveries have not equaled samples offered. In some cases these claims have been made in good faith; in others they have been just as evidently made in bad faith and in order to offset the conditions caused by a falling market or to obtain discounts to which the purchasers were not entitled. At present the only way of adjusting these is through processes of law, and to this there is no limit of time or expense involved.

If the two parties to a dispute see fit to voluntarily refer the question at issue to an authoritative central organization and to submit the respective merits of the dispute to this body with the knowledge that the claims will be quickly and authoritatively settled, a vast amount of time and expense will be saved, not only to the dyestuff dealer but to the consumer.

Of course, this all predicates the establishment of a Bureau of Standardization under the aegis of the National Association which will be composed of business men and chemists who would be absolutely impartial and whose operations would be above suspicion and entirely confidential. It is not to be believed that such a body could not be organized from the ranks of the dyestuff industry; the outlook for the industry would be dark indeed if it should prove to be impossible.

Another issue closely allied to the questions of standardization and arbitration of disputes is the one of the protection of contracts. The same body could very properly be invested with an adjudicating power as regards the protection of contracts. This is a question which is going to be of vital and widespread interest when conditions begin to attain normality, even if it has not become an active factor in the business as yet.

In the panic stricken times of 1915 and 1916, the color consuming industries were willing to sign contracts at almost any price, some of these contracts running for periods of two and three years from that date. Now a contract is not a contract unless it is equally binding on all parties thereto, and the difficulty is that a great many contracting parties only desire to be bound by a contract while it still operates in their favor. As soon as the market falls and prices range lower, they are apt to demand to be released altogether from the contract, or to have it adjusted so as to correspond with the new conditions. Where the manufacturer can do this without loss to himself by reason of his ability to buy his raw materials at lower cost, it is undoubtedly commercial wisdom for him to do so; where, however, the manufacturer has committed himself in good faith to other contracts on his part for raw materials, to which he is compelled to adhere, a breach of contract on the part of his customer at once works manifest injustice to him.

If, therefore, there is a central authoritative board in which both the dyestuff manufacturers and the consumers have confidence, to which the merits of such a dispute as regards contracts could be submitted, shorn of endless litigation and limitless expense, it would be of unquestionable value to

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Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

MYRON DREW REESER, Managing Editor

Regarding Editorial Policy

IT has been brought to our attention that certain dealers in dyestuffs have misinterpreted the spirit of some of the editorial comments which have appeared in these columns relative to the ethics, or rather lack of ethics, shown by some persons and firms engaged in the dyestuff industry.

From the comments which have reached us it would appear that the spirit of these editorials has been misunderstood. Because of the fact that we have condemned in no uncertain terms many unbusinesslike and unscrupulous practices which have been prevalent in the trade and because it has in most cases been the small dealer or broker who has been guilty of these practices, it would appear that other dealers whose business methods and morals are above reproach have taken our criticism to apply to all those who are not actual manufacturers.

This is very far from our intention. All of our editorials condemning unscrupulous business methods have been directed at the methods themselves and in no sense at any class of persons or concerns. In other words, it is the individual or concern who dilutes or adulterates his product, who delivers goods not in accordance with samples submitted and who misrepresents his goods in any one of the countless different methods we have known to be used—it is this person or concern whom we condemn.

There are manufacturers—chiefly, it must be admitted, small manufacturers—who have been fully as guilty in this respect as have some of the brokers who are most commonly mentioned when methods of this sort are discussed. Such manufacturers are open to even more serious criticism than are the brokers because of the fact that they actually make the product which they offer for sale and hence can in no possible manner be excused for not knowing exactly what this product is. In the case of some brokers, on the other hand, it is possible that carelessness or lack of technical knowledge may have caused them to honestly believe they were selling a certain grade of goods when in fact it was something decidedly inferior.

In view of the above facts we wish to take this opportunity to correct any misapprehension which may have existed in the minds of our dealer and broker friends. We shall continue as in the past to condemn most strenuously all practices which in our opinion tend to bring the dyestuff industry into disrepute and shall expose, without hesitation, individuals or firms guilty of such practices whenever we can obtain conclusive proof of their wrongdoing, but we wish it to be distinctly understood that we are in no sense condemning any particular class of interests in the profession. Every individual or firm connected with the dyestuff industry knows perfectly well whether or not he is guilty of unscrupulous business practices. If he is, then our editorials condemning such practices are directed at him. If he is not, then they do not concern him in the least save as they are an effort on our part to make his competitors live up to the standard of business integrity which he sets for himself.

Address of Mr. H. Gardner McKerrow

(*Continued from page 7*)

all parties, and its decisions, besides being rendered with reasonable promptness, would necessarily be based on commercial considerations of equity, rather on the abstruse and mystifying construction of law.

One of the most important points for consideration by this convention

is the question of an adequate degree of protection to be afforded to the industry by the United States Government. We have with us today representatives of the United States Tariff Commission, and Dr. Grinnell Jones will address us later, and give us some idea of the work that this Commission has already done, and proposes to do, to effect a tariff which shall insure the industry against extinction when the present disturbed conditions are past.

Whether the present rates of 30 per cent. ad valorem and 5 cents per pound specific on finished dyestuffs and 15 cents ad valorem and 2½ cents per pound specific on intermediates is sufficient to enable the industry to meet post bellum competition is a question on which the United States Tariff Commission would like the expression of opinion of those engaged in the industry.

There are other features of the present tariff law as applying to dyestuffs which are unquestionably unwise, and are a menace to its permanent existence. I refer to the provision that after five years from the passage of the act in 1916, if the President should find that 60 per cent. of all the dyestuff requirements of the country were not made in the United States, he could arbitrarily by proclamation annul and cancel the specific rate of duty, and furthermore, that in any event after five years from the passage of the act, one-fifth of the specific rate shall be automatically dropped until at the end of another five-year period, the entire specific rate shall have been eliminated.

How the estimation of whether 60 per cent. of the dyestuff requirements of the country shall be calculated involves a number of technical and intricate questions on which we shall doubtless hear something today, and into which I shall not go at this time. It is, however, clear that the existence of these stipulations does not tend to encourage the investment of the best and most permanent kind of capital. With the possibility of the wiping out of a large measure of the protection at present in effect, constantly in view, conservative capital looking for permanent investment will necessarily hesitate before committing itself to the support of the industry, and will leave the exploitation of the undertaking to the more undesirable and speculative kind of capital willing to take chances of quick and large returns during the period when such a condition exists.

The United States Tariff Commission has expressed the desire of cooperating closely with an authoritative trade organization representing the dyestuff industry as a whole, and I think we shall find that the representatives of the Commission who are with us today are quite prepared to give us all the encouragement we can expect that when the judgment of the trade is fully expressed, our interests will be safely guarded against unfair competition by those seeking to regain control of this market.

The question of patents as affecting dyestuffs also is a matter of interest, and on this point also we shall have some information today from a gentleman who has made a close study of

the question and is eminently qualified to speak on this subject.

There will undoubtedly be other issues raised during this meeting which will, I hope, bring forth an exchange of opinion and which will be of benefit to our industry, but there is one question, not especially peculiar to our industry but which constitutes a distinct menace to our industrial life in many lines, on which I hope this convention will give some unmistakable expression of opinion—that of the use of bribery to effect sales, and to secure monopoly of control which otherwise would not be available. It has been distinctly and characteristically a German practice, and has prostituted the dyeing industry not only in this country but in all other industrial centres, Great Britain, France, Italy and Russia. It has been one of the insidious and pernicious methods by which the world-wide German domination of the dyestuff industry has been built up. While enlightened nations have been effecting legislation to eliminate unfair competition, it has eaten at the very root of the underlying idea, that of regulating the conditions of trade so that the small merchant may have an equal right of existence and to the profitable continuance of his business as the large merchant. It has been a festering sore, the more dangerous in that it has necessarily been secret and unseen, which calls for a drastic and ruthless application of the knife.

It is not amenable to defence, and the only reasons for its continued existence are that there are some influences which see their own self-interest involved in its retention, or that we *are* too timid to recognize its existence and to take a firm stand on the side of right and justice. In that it cancels the reward of merit and frustrates the rightful development of true progress, it is unfair, unmoral and un-American, and the influence of this proposed association cannot be exercised in any more righteous direction than in the destruction of this baneful disease which has been imposed on our industrial body.

This, gentlemen, is a brief outline of the ideas which have actuated the calling of this convention, and I commend them to you with all reservation, and as being simply an individual expression of opinion, believing that the exercise of your good sense and business intelligence will work out a line of development which will make our new industry, created so successfully, and with such unparalleled promptness, a permanent and valuable asset of our industrial life, with the interests of all, both large and small, and whether manufacturer or dealer, properly and fairly considered and safeguarded against unfair discrimination and competition from any source either inside or outside our own ranks.

The full report of the Organization Committee and the names of those who attended the convention will be found on pages 12, 13, 14 and 15.

A Substitute for Rhodamine

Phloxine is the nearest substitute for Rhodamine that is made here at present. The quality is beyond criticism but the quantity is limited.

INQUIRY DEPARTMENT

In the establishment of this department it is our desire to help the consumer in buying his products direct from the manufacturer or reliable dealer. Accordingly all questions relative to source of supply will be answered to the best of our ability in an impartial way.

Furthermore, we propose to help in any difficulties that consumers may be having with dyes and chemical products providing that questions do not involve simply tests, which can be readily obtained from those who specialize in such work.

We hope that the consumer will not hesitate in making use of the department, for all questions relative to processes, etc., will receive the personal attention of a chemist who is fully qualified to handle the subject.

A Color Base

Question:—What is a color base and what may they be used for?

Answer:—A color base is the active part of a basic dye, that is, the coloring matter that remains after the removal of the acid. As it still retains the power of uniting with acids it may be used for making new varieties of dyes. The principal combinations are with the acids of fats, oils and resins and occasionally with Phenol. The bases are also used in the manufacture of printing inks, typewriter ribbons and carbon paper.

Soluble Blue

Soluble Blue, not the solubule Prussian Blue, but what was also known as Paper Blue or Water Blue, derived from Rosaniline, is just beginning to make its appearance. The red shades of this product are in demand by laundries and paper mills for blueing whites. It requires to be acidulated, as the color is destroyed by alkalies and soap. Silk throwsters also use this dye as a stain which will wash out readily.

Oil Soluble Colors

Oil soluble colors in a variety of shades are now obtainable. They are extensively used by makers of wood stains, printing and lithographic inks, varnishes, lacquers, soaps, candles, etc.

Crystal Violet

Crystal Violet, otherwise known as Violet 6B, fills a need not covered by Methyl Violet. This is the only variety of basic violet which can successfully be used to make copying typewriter ribbons.

Acid Green G G

Acid Green G G is now obtainable in paste form as is also Fast Acid Violet 10B. As these are both particularly difficult products to dry the saving in this expense compensates for the slight trouble in handling. The shades are both clear and brilliant and in no way inferior to the foreign types.

Eosine for Lakes

Eosine for lakes and inks is being turned out in good quality. There never was much sale of Eosine as a dye for textiles on account of its slight resistance to light, but for its particular uses had no real competitors.

Fast Scarlets

Direct Fast Scarlets and Pinks, which resist strong acids, are likely to have their effect on the market before long. There is quite a demand for reds superior to the Congo Red which never pleased anyone, and these new products meet a real need.

Do not be disappointed if the reply to your query misses the immediate issue. You will find it taken care of in the next number of the *Reporter*.

Nebraska Potash Production

Nebraska's daily production of potash runs from 450 to 500 tons, and the output is increasing as rapidly as new potash-plants are constructed.

This potash is extracted from the numerous alkali lakes of northwestern Nebraska. . . . The potash industry in Nebraska is less than two years old. So high is the brine content of the alkali lakes that the potash product ranges from three to five times the content of the product Germany shipped to us in the years gone by. One of the large potash plants is located at Antioch, which three years ago was a mere flag station with a cattle chute for the convenience of the cattle-raisers of that section. To-day it is a thriving little city of 1,500 people, with electric lights, telephones, post-office facilities, and a newspaper. There are four such mills in active operation in Sheridan County, with three or four others under way, and new companies are being formed every day. Some of the alkali lakes are owned outright by the potash companies; others are leased from the owners upon a royalty basis. The State of Nebraska owns many thousands of acres of school lands, which are leased on a 6 per cent. basis, and the revenues derived therefrom used for public-school purposes. There are numerous alkali lakes upon these school lands, and the State is leasing them on a royalty basis, the royalty averaging 12 per cent. It is expected that within the next year the school fund will profit at the rate of several thousands of dollars a day from potash royalties. Until the discovery that these bitter-water lakes were rich in potash they were deemed a great nuisance by cattlemen of that section. They covered vast areas, the water was unfit for use, and in times of storm cattle drifted into them and mired down, perishing miserably. To-day the ranchman who has an alkali lake upon his ranch need not worry about the price of cattle—his fortune is as good as made. For instance, Krause Brothers, near Antioch, are profiting at the rate of from $1,100 to $1,300 a day from royalties received on potash produced from only one lake on their ranch. And they have other lakes not yet developed. Three years ago the United States manufactured less than 5 per cent. of the potash used therein. To-day we are producing 25 per cent., and Nebraska is producing 20 per cent. of that.—*Literary Digest.*

Temporary Officers

Chairman, Frank Hemingway of New York City.

Secretary, C. Cyril Bennett, a publisher, New York City.

Treasurer, C. D. Jenkinson of the National City Bank of New York.

Organization Committee: Dr. J. Merritt Matthews of New York; L. A. Ault of Cincinnati; August Merz of New York; W. S. Woodward, T. N. Hyndman, H. Gardner McKerrow and S. R. David.

Report of the Organization Committee

The Organization Committee appointed by the Chairman of the convention of the Dyestuff Manufacturers of America duly met and organized by electing Dr. J. M. Matthews as Chairman of the Organization Committee.

The matters submitted to the Organization Committee by the convention have been duly considered and the Committee recommends that it be continued in power until the first annual meeting in order that the various details of membership, in-

corporation, committees, etc., may receive proper attention. It suggests that the convention adopt the following resolution:

Resolved, that the Organization Committee appointed by the Chairman be empowered to continue to act as such until the first annual meeting of the association with power to

1. Prepare and file a certificate of incorporation;
2. Prepare By-laws for submission at the annual meeting;
3. Arrange the time and place of the annual meeting;
4. Entertain and pass upon applications for membership;
5. Confer with the Tariff Commission and report at the annual meeting.

And be it *Further Resolved* that the temporary Chairman, Secretary and Treasurer elected by this convention continue to act as such until the annual meeting.

The Organization Committee further suggests as a matter to be considered by the convention, the name of "DYESTUFFS ASSOCIATION OF AMERICA" as the name of this association.

Representative Concerns Present at the Conference

The Sherwin-Williams Co., N. Y. C. J. O. Hasson, Mgr.; W. S. Woodrow, Eastern Mgr.

J. Early Wood, Inc., 21 Platt St., N. Y. C. Robt. B. Barnett, J. Early, Jr.

The Meth-O-Lene Co., Inc., 81 Fulton St., N. Y. C. (Tatamy, Pa.) Frank S. Bache.

The L. B. Fortner Co., 36-38 Strawberry St., Phila., Pa. Louis B. Fortner.

Dana & Co., 111 Broadway, N. Y. C. E. C. Hull.

Bowring & Co., 17 Battery Place, N. Y. C. Frank E. Morgan, Chemical Dept.

Dye Products & Chemical Co., Inc., 200 Fifth Ave., N. Y. C. Clarence K. Simon, President; Morris Simon.

John D. Lewis, Providence, R. I. Mr. Stephan.

The Calco Chemical Co., 141 Milk St., Boston, Mass. J. H. Cockroft, Boston representative; F. Miller Fargo, Jr., Sales Mgr., Woolworth Bldg., N. Y. C.

New York Commercial, 22-24 Vesey St., N. Y. C. E. G. Erikson.

The Barrett Co., 17 Battery Place, N. Y. C. Herbert G. Sidebottom, Technical Service Mgr.; D. W. Jayne, Mgr. Chemical Dept.

Dicks, David Co., Inc., 302 Broadway, N. Y. C. Frank Hartley (146 Summer St., Boston, Mass.) and Albert David.

U. S. Conditioning & Testing Co., 340-344 Hudson St., N. Y. C. Edw. Wallace Pierce.

E. Puigdengolas, S. C., 299 Broadway, N. Y. C. Luis Guillo, representative. Also Barcelona, Spain.

Chas. A. Johnson & Co., 55-57 Franklin St., N. Y. C. James F. Hurley.

Geo. H. Morrill Co., Norwood, Mass. O. L. Peabody, Olney P. Anthony, Chief Chemical Staff.

Read, Holliday & Sons, Ltd., Boston, Mass., and 160 Franklin St., N. Y. C. Controlled by British Dyes, Ltd., London; Norman W. Teale, Sec'y-Treas; Jas. Turner, Vice-Pres.

Holland Aniline Co., Holland, Mich. J. F. Quinlan, B. P. Donnelly.

Stubner Chemical Works, 833-839 Magnolia Ave., Elizabeth, N. J. A. P. Sachs, Chief Chemist.

The Althouse Chemical Co., Reading, Pa. C. Scott Althouse.

Percival Thomas, Jr., representing American Dyewood Co., Hoboken, N. J.

John J. White, New Brunswick, N. J.

United Oil & Chemical Corp., 61 Broadway, N. Y. C. Randolph Norris Shreve, Works Mgr., and Mr. Ruhm and Mr. Chas. S. Wherly.

Buffalo Foundry & Machine Co., 17 Battery Place, N. Y. C. H. F. Case, E. G. Sleeper.

Bureau of Standards, Washington. Irwin G. Priest.

Bureau of Foreign & Domestic Commerce, Dept. of Commerce. L. F. Schmeckebier.

Fuerst Bros. & Co., 2-4 Stone St., N. Y. C. Samuel Levinson.

Newport Chemical Works, Inc., Milwaukee. Wis. Stanley Shultz, L. I. Holdredge.

Certified Chemical Corp., 246 Plymouth St., Brooklyn. H. O. Britton, Treas.

The Heller & Merz Co., Newark, N. J. August Merz.

Fisher Chemical Co., Dealer. Carl Spencer Fuller, Salesman.

Grannel Jones, Chemist for U. S. Tariff Commission.

Metal Disintegrating Co., 3 So. William St., N. Y. C. S. G. Schatzberg.

Oil, Paint & Drug Reporter. Harry J. Schnell, Gen. Mgr.; Sidney W. Dean, Editorial Dept.

Fred Wetzel & Co., Clifton, N. J. C. Tolpfer.

Dye Exchange Corp., N. Y. C. Bradford Webster, 141 Broadway, N. Y. C.

Peerless Color Co., Inc., Bound Brook, N. J. R. W. Cornelison, Sc.D., Pres and Gen. Mgr.; W. H. Fieldhouse, 176 Federal St., Boston, Mass.

Essex Aniline Works, Inc., Boston, Mass. Mr. H. W. Hyde, President.

American Color Mfg. Co., Passaic, N. J. Elvin H. Killheffer, Pres. and Treas.

Berlin Aniline Works, 213 Water St., N. Y. C. E. O. Patz, Pres. and Mgr.

Textile Colorist, 607 Lafayette Bldg., Phila., Pr. Emil Frank, Mgr.

Holliday-Kemp Co., Inc., 90 William St., N. Y. C. Hugh J. McGrane, Vice-Pres.; Cornelius Tuynman, Director.

Logwood Products Corp., 116 Broadway, N. Y. C. S. C. De La Garza.

Myron Drew Reeser, American Dyestuff Reporter.

Journal of Commerce, 32 Broadway, N. Y. C. Harold S. Johnson.

American Wool & Cotton Reporter, 530 Atlantic Ave., Boston, Mass.

The Bayer Co., Inc., 117 Hudson St., N. Y. C. Dr. Robert J. Pabst, Rensselaer, N. Y.; Herman C. A. Seebohm, Treas.

Sizing Specialty Co., 26 Florence St., Jersey City. Alfred Spice.

The Dow Chemical Co., Midland, Mich. James T. Pardee, Vice-Pres. and Secy., 1020 Clifton Blvd., Cleveland, O.

Edward S. Chapin, Consulting Chemist, 516 Atlantic Ave., Boston, Mass.

U. S. Dye Products Co., Inc., 801 Vernon Ave., Long Island City, N. Y.

Hide & Leather, published by Jacobsen Publishing Co., Chicago, Ill.

Western Aniline Products Co., Hammond, Ind. T. C. McCall, President.

Delta Chemical Co., 258 Broadway, N. Y. C. J. F. Hollywood.

The Chemical Engineer, 118 E. 28th St., N. Y. C. Laurance T. Clark, Editor.

Edward E. Rice & Co., 620 Atlantic Ave., Boston, Mass.

E. M. & F. Waldo, 11 Broadway, N. Y. C. Edward M. Waldo.

John I. Solomon, friend of Mr. Kaye.

The Ault & Wiborg Co., Cincinnati, O. A. Brooking Davis, Chemical Director; E. A. Ault.

Cosmic Aniline Works, Inc., 8 W. Broadway, N. Y. C. Carl Katzenstein.

Walter B. Walker, Editor, 17 Madison Ave., N. Y. C.

Takamine Laboratory, Inc., Equitable Bldg., N. Y. C. Ralph L. Reynolds.

Manhattan Trading Corp., 2 Rector St., N. Y. C. E. R. J. Graf, Pres. and Treas.

Dunker & Perkins, 287 Atlantic Ave., Boston, Mass. Chas. H. Dunker, Eugene C. Perkins.

Stanley Aniline Chemical Works, Lock Haven, Pa. Dr. I. V. Stanley Stanislaus, Pres.

Cambridge Color & Chemical Co., Boston, Mass. W. J. Beattie.

Middlesex Aniline Co., Inc., 732 Singer Bldg., N. Y. C. Lincoln, N. J. A. R. Curtin, Secy.; A. R. Kreuger, Supt.

Iridescent Dyestuff & Color Co., Brooklyn. Dr. A. R. Frintz.

N. Y. Color & Chemical Co., Inc., 212 Pearl St., N. Y. C. P. R. Mackinney.

American Dyewood Co., 648 The Bourse, Phila., Pa. Philip C. Leonhardt.

Journal of Industrial & Engineering Chemistry, 35 E. 41st St., N. Y. C. Geo. W. Nott, Adv. Mgr.

Sherman & Mason, 211 No. Front St., Phila., Pa. L. H. Mason.

Metallurgical & Chemical Engineering, 239 W. 39th St., N. Y. C. R. C. Bergen, Asst. Editor.

Color Investigations Laby., Bureau of Chemistry, Washington, D. C. Miss Aida M. Doyle.

John J. White, Inc., 149 Broadway, N. Y. C. John J. White, President.

Frank L. May & Co., Inc., 99 John St., N. Y. C. Arthur C. Kaufmann.

Ernest Zobel Co., Inc., Second Ave. and 10th St., Brooklyn.

Zobel Color Works, Second Ave. and 10th St., Brooklyn.

Zobel, Stein & Campbell, 138 Water St., N. Y. C.

Atlas Color Works.

Colours Co., Inc. Represented by Wyckoff Bennett.

The Grasselli Chemical Co., 80 Maiden Lane, N. Y. C.

Marden, Orth & Hastings Co., 61 Broadway, N. Y. C. Mr. Shepherd M. Crain, Jr., Asst. Mgr.; Mr. C. A. Mace, Sales Mgr., and Mr. Herman G. Weicker.

Color Trade Journal, 200 Fifth Ave., N. Y. C. Represented by J. Merritt Matthews, 50 E. 41st St., N. Y. C.

Bay State Chemical Co., Boston, Mass. E. J. Feeley.

Dicks, David & Co., 302 Broadway, N. Y. C. Represented by Mr. Benj. F. Lippold.

Stillman & Van Siclen Chemical Laboratory Co., Inc., 6 Church and 109 Liberty Sts., N. Y. C.

John C. Sparks, 30 Church St., N. Y. C.

T. S. Todd & Co., 42 Broadway, N. Y. C.

Edgertyn Aniline Corp., 118 William St., N. Y. C. E. S. Alyton, rep.

Jennings & Co., 261 Franklin St., Boston, Mass. Mr. Waldo Farrar.

Nathan Salowejozyk, 976 Anderson Ave., N. Y. C. Mr. N. Solow.

Hine Brothers, 80 Maiden Lane, N. Y. C. Mr. Arthur Hine.

Canadian Electro Products Co., Ltd., Montreal, Canada. Mr. Victor G. Bartram.

Watson Jack & Co., Ltd., Power Bldg., Montreal, Canada. Mr. W. R. Allen.

F. X. M. Lehmann, 261 Broadway, N. Y. C.

Mr. J. D. Lewis, Providence, R. I. Mr. J. P. Stephan.

Ellwood Hendrick, 139 E. 40th St., N. Y. C.

The Western Reserve Chemical Co., 3434 E. 93rd St., Cleveland, O. Mr. H. J. Sherwood.

Frank Hemingway, Inc., 115 Broadway, N. Y. C.

Warehouse Mercantile Co., 24 State St., N. Y. C.

Kuttroff, Pickhardt & Co., 138 Duane St., N. Y. C.

The A. & B. Export & Import Corp., 78 Wall St., N. Y. C.

Hydro-Carbon Chemical Products Co., Cardington, Pa.

Herman & Herman, Inc., 6 Church St., N. Y. C. Mr. Jas. R. Edwards, Treas.

United Chemical Products Corp., York and Colgate Sts., Jersey City, N. J. C. T. Hamilton, Pres.

United Aniline & Chemical Works, Inc., 377 Broadway, N. Y. C. Mr. L. Araps, Secy.

Century Colors Corp., 182 Front St., N. Y. C. Otto L. Obermaier.

United Oil & Chemical Corp., 61 Broadway, N. Y. C. Chas. S. Wehrly.

AMERICAN
DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 2 New York, February 11, 1918 No. 2

Apropos of Standardization and Conditions to Be Analyzed

No factory can make dyes absolutely uniform, like books and moving picture films, they must be edited, i.e., standardized. The safest way to do this is by mixing the output of a fairly long period, which gives a fair representation of the factory output which is not so hard to duplicate. At present the average small factory, in taking up the manufacture of a new color, has at the initial performance the head chemist, who gives it particular care or uses a lot of raw material that is supposed to represent what they are going to get in the future. The result is that the lot turns out extra fine and is made a type—future lots seldom come up to this lot, many have had this experience. There is always a temptation to sell an extra quality batch and make it the standard and when the regular run fails to come up to this standard to doctor and patch it up somehow. A lower standard with greater uniformity and conformity would be better appreciated by the customer.

The customer should be educated also and shown that it is more to his interest to use the American types as they are and not require them to be shaded and touched up to match some foreign type. Any dyer who is worthy of the name can use colors in combination, when they are near the shade he requires, providing they have the necessary properties, but the one who demands an exact match for the foreign product he is using is confessing his lack of ability.

Before the war, the importation of dyes offered a fine opportunity for fraud, if any of the foreign houses and their American branches had been other than honorable gentlemen. Concentrated products could have been sent over and billed as single strength and the duty thereby divided by four or five. Then there could have been places where the reduction to type was made and they could have easily undersold the American product or the Swiss import. After the war, there should be a man who really knows dyestuffs at every appraiser's store in the customs service, to simply remove the temptation, as it were. It would be unwise to say that this actually was done because direct proof is lacking, and it is unjust to condemn anyone on circumstantial evidence, but that does not prevent anyone having their own opinion.

Not Written in a Spirit of Criticism

The foregoing remarks are not offered in any adverse spirit of criticism, but to suggest what may be expected and to point out the weak points where the enemy will most likely attack. At the present time the entire organizations of the German branch houses all over the world are trying to hold to-

gether, keep their customers and a nucleus of sales force, so that as soon as they are able to begin again on the old basis, they will have a veteran army to confront those who are now content to go on making money out of the present opportunity and not preparing for the future.

One large organization has been perfected and is in readiness, those which will come later will need to learn a few things that cannot be worked out in the laboratory, but the small factory of today need not pass out of existence if it will settle down to making high grade goods of any kind at all, but which are the best of that kind and noted for their uniformity. Before the war Dr. Remy at Crefeld made and did a large business in Malachite Green and Methyl Violet with the result that many of the large factories preferred selling his products to making them themselves. It is always better to do one or two things and do them well than to have an extensive line of second rate productions.

After all this the greatest thing is a *protective tariff* that will give the necessary confidence to capital and after the world has been made safe for democracy, will make the United States safe for business.

A Chemical War—Commercially and Otherwise

This is a chemical war in many less spectacular ways than the manufacture and effects of explosives and poisonous gases. Among the less conspicuous are the purely textile applications of chemistry. Of these, perhaps first in importance is the bleaching of cotton for guncotton manufacture. This already runs into a tremendous tonnage and while it is carried out along the same general lines as other cotton bleaching, the requirements are very exacting and the product is subjected to careful control by chemical analysis for residual impurities. Another almost equally refined product is absorbent cotton, bleached in the same kiers as guncotton, but for quite the opposite purpose. It, too, has to meet certain requirements that are best defined in the terms of chemical analysis. If these requirements are met, the properties of the product and efficiency of the bleach are then beyond dispute.

There are government orders for millions of yards of gauze for surgical use, and other orders for immense amounts of cotton goods for tents, light weight clothing and many other purposes. As far as this has to be bleached, it should be subjected to careful analytical control by tests of solutions as they are being applied and further tests of the goods after each operation, to be sure that any residual acid, alkali or chemic is thoroughly removed after doing its work and before it can cause any injury. Every yard tendered or otherwise damaged is not only a waste, but cuts down production, perhaps at the very time of greatest need. Such trouble can be almost entirely eliminated by proper supervision and at comparatively little expense. Similar methods are already followed in up-to-date bleacheries and the fact that such firms employ them should be sufficient recommendation.

Possibilities in Dyeing

Coming to the dyeing of khaki and olive drab, there are new problems for

the chemist as well as the dyer. Mineral khaki dyed from chrome and iron is a separate problem in every mill and we may almost say, on every machine. It can be done in a variety of ways and on different types of equipment. Perhaps a little search will reveal possibilities in discarded padders and agers that can be rebuilt to dye this government tent cloth.

Sulphur dyes in their present stage of development are also full of possibilities for chemical research. New dyes, slightly faster, are always welcome and there is plenty of opportunity for improving the methods of dyeing them in the piece to get more uniform and level results as well as to reach the standard set by government tests. This is for the most part purely chemical work involving, first, a study of colors and their impurities with the effect of the latter on dyed results, and, second, a study of additions to the dye bath, involving a search for materials that will retard oxidation, or more properly control it, and at the same time promote penetration and levelness.

At the first Exposition of Chemical Industries in 1915, there were good exhibits of American-made dyes, but nobody had much of anything to sell. Now we have vastly larger manufactories and a wide range of available colors to select from. To get a satisfactory olive drab on wool, even with all the German coal tar dyes available, was a rather formidable task if the utmost requirements of the specifications were adhered to. Naturally with fewer brands on the market it is more of a problem. There is no good reason why chemical research should not, however, be especially directed toward the development and manufacture of dyes for these special shades. While at present millions of yards are being colored, the results are not any too satisfactory and an extended organized investigation covering all available natural and synthetic dyestuffs of reasonable fastness might finally yield some excellent combinations. Often colors that are inferior in some one particular will show up well in compound shades, the deficiency being masked by other dyes in the formula that are fast in the particular respect in question.

There is still some trouble in dyeing blues. The amount of indigo available for raw wool stock is insufficient and the dyeing process slow. To expedite production it may yet be allowable to color some classes of goods with alizarines or other more available chrome blues in the piece. Meanwhile a little in the laboratory with a view to having suitable formulas in readiness may be well repaid in the saving of time later. The success of the American dyestuff industry is assured beyond a doubt. Already it is said on good authority that about 70 per cent. of our goods are dyed satisfactorily and most of them with our own dyes, the balance of less than one-third being colored with dyes not quite as suitable for the purpose.

Conditions, however, may soon warrant the working of foreign patents for the manufacture of fast vat dyes of the hydron and indanthrene types, and some other particularly desirable patented specialties. The former are already being brought out in England. We should be able to work these out as well as the proposed manufacture of some synthetic drugs not now available and covered by German-owned patents. These fast dyes with a few other items not yet attainable will give us a practically complete range.

Chemist in Conservation

The textile chemist's task is not only in the direct preparation of materials needed in the conduct of the war. Conservation is more than ever the cry. Shoddy usually presents difficulties in carbonizing, stripping and redyeing, all of which are more problems for the chemist and dyer.

Conservation and food control may lead to restriction of the use of starches. Reports are already in circulation that wheat starch manufacture will be limited. From starches made from grains and other materials suitable for human food, it is then only a short step to those of more particular value as cattle feed. Present prices of grains are not only making beef and dairy products high, but threaten a real shortage. If these considerations force Government action on starches it seems that rightfully this should apply first of all to the more heavily starched finishes where large amounts of farinaceous materials are used and

last to warp sizing where starch is more of a necessity. In some cases it may be possible for the present to exchange one form of starch for another.

Meanwhile some chemical material, either natural or synthetic, cheap and not useful as food for man or animal, capable of being applied as easily as starch, and having its desirable properties, may be discovered. It will require diligent search among the by-products and waste materials of many industries and a study of gums and extracts from plants or investigations into the possible modifications of such gums or extracts. It is not at all impossible, however, that some such material can be developed as there are at present several gums on the market whose possibilities have no doubt not yet been fully exploited. (Obviously this does not refer to British gum, or other so-called gums sold for sizing which really consist only of modified starches.) Such an extended research would no doubt be beyond the ability of any one mill to undertake, but if once entered upon by anyone sufficiently interested and carried to a conclusion, the results might be of a very great value.

Testing Materials

It is also quite legitimate to keep one's own interests in mind and a line of work that every mill can undertake either in its own or an outside laboratory is the examination by analysis of its supplies. The high prices now prevailing are a temptation to adulterations of even the common articles such as acids and alkalies, formerly too cheap to be profitably manipulated. If on account of the present scarcity of heavy chemicals it is found best not to make serious complaints it is worth something to know what dealers have taken advantage of their customers and later to treat them accordingly.

There is also more chance for work in connection with the dyestuff supply. Some colors, like sulphur black and methyl violets, are on the market in various strengths from a variety of makers. In these cases competitive money value tests should be made and may prove far more fruitful than the hair-splitting tests that were often run during the lively competition just before the war, when often only a cent or two per pound was at stake.

The numerous new colors continually appearing require to be tested carefully for strength; working properties and fastness, particularly as many of them are claimed to embody improvements over the colors first put on the market by our dye firms to satisfy the recent stringency. As a specific case, new reds of the nature of Benzo-purpurine or Delta-purpurine are now appearing to replace Congo red, with better shades and properties.

In conclusion, it is only fair to again recall what the chemists have done in the past three years in the textile field. The debt is most conveniently measured in terms of dyestuff factories. The number has grown from five to many times that number of establishments making either dyes or the necessary intermediates. The production is now fully ten times as great and may reach fifty million or more pounds as this year's total. The chemist has been growing into his

proper place in many industries and now at last into textiles where so many of the operations involve the action of chemical reagents on impurities in the fiber or upon the various fibers themselves, all of which are, strictly speaking, chemical materials.—*By Charles F. Goldthwait in the Textile World Journal.*

Fairly Large Selection of Dyes for General Work

There is a fairly large selection of dyes for the general work of dyeing yarns and pieces in solid shades, whatever process is used. The most adaptable yellow for all the chrome processes is generally sold as "alizarine yellow." This name covers a number of colors, none of which are either alizarine or anthracene derivatives, the majority being salicylic acid couplings with diazotized nitranilines or else pyrogallic acid condensation products. These yellows may be dyed in any of the three chrome processes and are remarkably fast to all influences. As with the acid dyeings the yellow element is the principal factor in the shade. A red is needed to prevent the blue or black from turning the shade to a green tone. The main consideration for the red used is that it shall dye evenly, and this seems to be the rarest quality of the available reds. Cloth red may only be used on a chrome mordant as the tendency to cloud the goods is very great, and on a chrome bottom the greatest care must be observed in regard to heating or the red will take on rapidly in spots. Omega Chrome Red and the Erio Chrome Reds are very satisfactory products and can be dyed by any of the three processes. Union Fast Claret is another excellent red of universal adaptability and remarkably fast, but we do not hear much of it at present. True Alizarine Red has again made its appearance, but it is not advisable to use the insoluble paste for shading, but the bisulphite compound, Alizarine Red S, would be quite suitable.

For the blue element there is a fairly large selection of blue-blacks and blues. The average chrome black of the Diamond or Palatine series, now on the market, while essentially after-chrome colors will dye on a chrome mordant and most of them will dye by the one-bath process. The dyeings are not as fast as when after-chromed, but are sufficient for goods that do not have to stand fulling. Blues of the Sulphon series are also available at present. They are difficult to dye level when used as acid colors, and after-chromed, but give less trouble in this respect when dyed on a chrome mordant or by the one bath process. Even the acid black, corresponding to Naphthol Blue-Black can be well utilized on mordant or after-chrome dyeings and the fastness to light will be sufficient for most purposes.

Much of the goods that are being dyed at present will be found to fall into one of the classes previously enumerated, but few of them are up to the strict requirements of the Government. At present there may be a tendency to be lenient and on account of the instant need for the goods to pass much which would otherwise be rejected. No one can tell when the specifications will be insisted upon more rigidly and it is well to consider how the color can be made to stand up to the most strict requirements.

Before the war the fastest standard for 16-ounce Melton, for instance, had been dyed with a combination of vat dyes, but as these are not now obtainable we will only consider the best means at our command at present.

Practice in Best Mills

The practice in the best mills, for meltons, flannels, tops for sweater, hosiery, glove and other yarns and for blanket wools was to chrome both before and after dyeing. A mordant of 2 per cent. of bichromate and 1½ per cent. to 2 per cent. of crude tartar, boiled for one hour, was the common practice. This was not a well reduced mordant and a certain amount of reduction of the chromic acid evidently took place during the dyeing process. While chrome assistants are scarce and high in price, the previous remarks regarding the use of sodium bisulphite might well be applied here. After the mordanting a rinsing followed and gave an opportunity for the wool to cool slightly and for the dyebath to be started cool in order to assist evenness and penetration.

The principal dye as before is Alizarine Yellow, the fastest color of the combination. The ideal blue or black is Alizarine Blue-Black, also known as Alizarine Black S (No. 423 in Green's translation of the Schultz and Julius tables). In the absence of this we may use a chrome black of the Diamond Black F type, but allowance must be made for a slight loss of color which occurs during the later processes.

There is not much choice of reds at present and red is the weakest point in the combination at all times. Before the war the old specifications, requiring a test with lactic and citric acids, might as well have been worded, "No red dyestuff can be used excepting Chrome Fast Red G or R," for all other red or reddish brown dyes failed to pass this test successfully. Even true alizarine reds were rapidly decolorized, although they were much faster to light and the washing tests.

One of the next best reds was Diamine Red F, which although a cotton color is also a remarkable chrome red. It dyes very fast shades by any of the three processes, using chrome on wool, and levels well.—*Exchange.*

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Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

MYRON DREW REESER, Managing Editor

For the Good of the Industry

WE have heard some comments made throughout the trade concerning the amount of space which we have devoted to the proposed Dyestuff Association of America and in particular to the activities of those interests which have been prominent in promoting its formation. The question has been raised whether or not we were working in behalf of any particular interests and whether or not we were giving the matter more publicity than was justifiable on a non-partisan basis.

In reply to questions of this sort we can only say that the interest we have shown in this Association has been inspired purely in that we honestly believed it to be a step in the right direction, and in no sense because we were particularly interested in any of those persons or organizations which have been prominent in the movement. From our point of view it is not a question of what particular firms or individuals were responsible for starting the movement—the point is whether such an association, if formed, would be of benefit to the trade at large.

As to this latter point we believe there can be no question. It is undoubtedly true that an association of this sort, like any other entirely new undertaking, will meet with opposition from certain sources and that before a really effective organization can be completed, countless problems of varying degrees of complexity will have to be solved. There is probably no industry more filled with misunderstandings, petty jealousies, etc., than is the dyestuff industry, and it is self-evident that it will be a task of very considerable magnitude to harmonize all the conflicting interests. We believe, however, that it will eventually be possible to effect such harmony, or at least something approaching harmony, and that when this is finally accomplished the result will be decidedly beneficial to the trade at large, whether manufacturers, dealers or consumers.

It is possible that the present efforts may not go very far in this direction. After the meeting to be held on March 6th it will be possible to get a much better impression as to what has been accomplished and what is likely to be accomplished than it is at the present moment. Of one thing, however, we are confident — this is that an association of some sort ought to be formed and that it eventually will be formed. In the meantime any effort looking to this end is worthy of the support of all interests in the trade until it has been definitely shown that it is unworthy. Hence the AMERICAN DYESTUFF REPORTER will, as heretofore, continue to support this movement to the best of its ability until it is satisfied that no good can result from such support.

It would appear that some of those who have been receiving the AMERICAN DYESTUFF REPORTER during the past months have not read the editorials in its columns in which we have announced that we were about to request our friends to enter paid subscriptions to the AMERICAN DYESTUFF REPORTER beginning with March 1st. A certain number of subscription invoices were mailed a week ago and were very gratifying, there were some who seemed to be in doubt as to whether the bill applied to back subscription or was to take effect in the future.

We have rectified this error and future invoices which are sent out will be completely self-explanatory, but to those who failed to understand, we wish to say that it was our intention to have subscriptions entered at the present time to cover a period of one year from March 1st.

Worth While

WE are still of the opinion that a co-operative Publicity Association of Dyestuff Manufacturers to direct the placing of educational publicity will pay well.

We would again suggest that this matter be taken up at the meeting of dyestuff manufacturers to be held in New York City, March 6th, and that a schedule of cost and procedure be drawn up by an advertising man who knows the industry.

We would further advise the formation of a committee composed of advertising representatives of several large companies who would be given a specific sum to spend in educational advertising of products and developments in the industry.

The committee could censor all of the publicity given out by the association and could aid the press in eliminating the evil of misleading advertising.

The same thing is being done in a number of other lines, notably lumber, rice, fruits, paint, cranberries and other products. Surely the educational feature is necessary in the dyestuff industry and can be applied more readily to an infant industry than to one established for years.

Perhaps advice of this nature will be misunderstood, particularly as it comes from a trade publication, but there are honest trade papers even as there are honest dyestuff manufacturers.

Only by elimination can we find the reliable maker of colors and in the same way must we pass upon the trade publications, and a reliable paper should not fear the examination of a committee.

What would it mean to you who are in the market for dyestuffs and allied chemicals to be able to look upon the advertising of a company as being an announcement of products that they actually manufactured or controlled?

Madero Brothers Deny Knowledge of Quinine Substitution

OFFICIALS and employees of the entire organization of Madero Brothers, the well-known importers and exporters of chemicals, New York, are alike up in arms over the stigma which threatened to attach itself to the firm's reputation because of the action of Tonko L. Millic, an Austrian citizen and general manager of the concern, who was recently arrested and charged with the substitution of thirty-two cases of salicylic acid in place of a shipment of quinine intended for use in an Italian military hospital.

The cases in question were seized by officers of the Army and Navy intelligence Service at Pier 7, Brooklyn, New York. Millic's arrest followed, and at the time this issue went to press he was being held at New York Police Headquarters on the specific charge of grand larceny, on the allegation that he misappropriated $25,000 in connection with the transaction.

Ernesto Madero, the firm's President, who was in the South, was immediately reached on the long-distance telephone and started back at once. Pending his arrival, other officials of the company declined to discuss the affair in detail. When interviewed by a representative of the AMERICAN DYESTUFF REPORTER, Jose Miguel Bejarano, of the concern's Chemical Department, declared that a full statement would be forthcoming upon Mr. Madero's return.

"Mr. Madero is expected to arrive Sunday at the latest," said Mr. Bejarano. The officials of the company do not feel themselves authorized to make a statement until the arrival of the head of the firm. The only assertion they can make is that the present unfortunate affair concerns an employee of Madero Brothers only and does not affect the firm in the least. Details of the case as given by the New York *Times* follows:

"Officers of the Army and Navy Intelligence Service seized thirty-two cases of salicylic acid on Pier 7, Brooklyn, where it was awaiting shipment to an Italian military hospital in boxes marked quinine. The officers also arrested Tonko L. Millic, an Austrian citizen and general manager of Madero Brothers, importers and exporters, of 100 John Street. He is held at Police Headquarters on a charge of grand larceny on the allegations that he misappropriated $25,000 in connection with the sale of the alleged quinine to the benefactor of an Italian hospital.

"The officers also said that they intended to question Millic upon the substitution of the salicylic acid, which varies in cost between $1 and $1.50 a pound, for quinine, which costs about $1.20 an ounce. Although this salicylic acid was made by the action of a carbon dioxide on sodium phenolate, a form of carbolic acid, the officers said they did not think it likely that an experienced physician or hospital employe would make the mistake of administering it as quinine, because of the difference in appearance. They added, however, that chemists had told them that salicylic acid, if taken in a dose large enough or about fifty to one hundred grains, while it might not kill a

soldier, 'would make him sick enough to wish to go to a hospital.'

"The officers who made the arrest said that Millic several months ago had received an order for 2,000 pounds of quinine to be shipped to an Italian military hospital maintained by Felice Bisleri of Milan. A few days ago they said Millic sent a cable message that the 'quinine' was ready for shipment, and he received instructions to deliver it to the States Marine and Commercial Company, of 17 Battery Place, who would ship it from Pier 7. Employees of this company asserted the boxes had been received marked 'quinine.'

"Upon the delivery of the 'quinine,' it was asserted, a check for about $25,000 was drawn for a representative of the Madero Brothers, indorsed and turned over to Millic, who, the officers say, put the check in a bank to his own account. It was declared that payment upon the check had been approved by the American representative of Bisleri."

National Aniline & Chemical Company to Have New Home

The National Aniline & Chemical Co., which is to move about May 1 to its new building at 21 Burling Slip, will, with the Century Color Corp., a subsidiary of the National, occupy the entire ten floors of the building. The accounting department of the company will occupy the first and second floors. The managers of the drug, essential oils and gum departments will be located upon the third floor. On the fourth and fifth floors the salesmen, both for domestic and export business, will be found. The sixth floor will be given over to the correspondence department, the seventh to the advertising, publicity and filing departments, the eighth to the purchasing department and Board Room, and the ninth to the executive offices. On the tenth floor will be found the laboratories and the office of the technical director. The plan as drawn calls for 33 private offices. The building will be equipped with two electric elevators, pneumatic service, and every other necessary modern convenience.

A special meeting of the stockholders has been called for February 18, the date of the annual meeting, to vote on increasing the number of preferred shares that may be issued by 45,652 shares of the par value of $100 each, making the total of shares authorized 631,237, consisting of 235,247 preferred shares of the par value of $100 each, and 395,990 common shares without par value, and to increase the stated capital by $4,565,200, making the total stated capital as increased $25,504,650.

Notes of the Trade

Widenmann, Broiches & Co., Ltd., London, England, dealers in fine and heavy chemicals, etc., have opened an office in this city, at 52 Broadway, with G. A. Berenger in charge.

Heller & Merz, capitalized at $500,000 under New Jersey laws, has been authorized to do business in New York. P. Schnorrenberger is the company's representative in this city.

The All State Chemical Manufacturing Co., New York City, has been incorporated with a capital stock of $5,000 by D. E. Huebner, W. Graveur and F. J Nice.

Stockholders of Grasselli Chemical Co., New York, at the annual meeting last week, voted to increase the capital stock from $20,000,000 to $50,000,000. The new 35,000 shares of common stock are to be held for sale to employes of the company. The board of directors was re-elected.

The Southern Chemical Co., El Paso, Tex., has been incorporated with a capital of $20,000, and will specialize in saline products. The incorporators are David Russek, Robert G. Anderson, R. J. de Moranbart and Marcus Russek, Jr.

An addition is being built to the plant of the British-American Chemical Co., Ridgefield Park, N. J., which will cost $13,000. The plant was recently taken over by the British-American company. Previously it was the property of the Tennessee Copper Co.

The DuPont Chemical Works will be ready to make deliveries of synthetic indigo about the 15th of the month.

The Providence Dye Works of Rhode Island was damaged by fire recently. The loss is estimated at $40,000.

Albert Baker, who resigned as assistant sales manager of the Davison Chemical Co., Baltimore, Md., to accept a Government position, will make a survey of the country's acid materials, production and other essential features.

The Millmor Chemical Works have been incorporated under the laws of Delaware to manufacture and sell chemicals. The capital is $110,000 and the incorporators are T. C. Miller and Edward Greenberg, Brooklyn, and W. I. N. Lofland, Dover, Del.

The Kall Manufacturing Company, Philadelphia, textile chemicals and allied products, is planning to increase its capital from $5,000 to $50,000 to provide for expansion.

The Chemical Specialties Corporation, Jersey City, N. J., has filed notice of an increase in its capitalization from $25,000 to $75,000 to provide for expansion.

Olive Drab Tests Before and Since War—Ultra Violet in Dye Fading—Piece Dyeing

The shade which represents the most popular color of to-day is not new in any sense of the word, but is an adaptation of a style that has been more or less popular for many years, particularly in men's light overcoat goods. The standard heavy shades, black, navy blue and brown, readily lent themselves to mixing with white stock and the resultant oxford, cadet blue and drab are probably the oldest shades to be found in fabrics.

In standardizing the color for military

purposes, account has been taken of both the low visibility and freedom from contamination by the dust and dirt, which was enjoyed by the khaki originally used by the British troops on their cotton uniforms in India. The very name khaki has reference to its resemblance to the earth in color. As a solid shade it cannot be considered attractive and the many difficulties in the way of obtaining a fast, level piece dye at the time of its first adoption have, no doubt, had much influence in the choice of a mixed fabric.

The shade at present seen in the uniforms of the privates is much too yellow to conform to either the Government standard or good taste. The need of the materials, the leniency of the various quartermasters, and the scarcity of certain dyes, is responsible for this departure from the proper shade of color. The production of this extreme yellow tone, which becomes still yellower during wear, causes a great loss in the low visibility feature, which is a character of the proper color.

While much latitude was permissible during the early days of our preparing, because the dyestuff situation was the determining factor, there is not so much excuse now since a number of American factories are producing dyes that will meet all the necessary requirements. There is a real obligation for the manufacturers of fabrics for the use of the army to produce standard goods for several practical reasons. The sight of a body of troops with a variety of colors in their uniforms detracts from their appearance and, while not a fatal defect, is not to be commended. The difference is not sufficient to produce an effective camouflage, while the sight of a man with four contrasting colors in his coat, trousers, blouse and overcoat, and sometimes blanket, makes the word "uniform" somewhat of a joke.

There is a standard shade for olive drab, the means of producing it from all-American materials now exist; any mill equipped for dyeing wool stock can obtain the proper shade and fastness, even if they have only open kettles worked by hand. There is no reason why the production of anything so essential for the equipment of our army should remain a monopoly for either dyestuff manufacturer or woolen mill operator. All the facts regarding the dyeing of this important shade should be public property in order to facilitate production. The small mill that has been running on shoddy goods may be able to do its bit with but little additional equipment if the dyer can get necessary information, and the small dyestuff factory can make important contributions if an outlet is provided.

Before the war all the American branches of the large German dye factories maintained a force of demonstrators, who worked out the mill dye house problems, apparently without charge. The elaborate sample cards, and instruction books, and ready-mixed-matched dyes did much to prevent the development of that initiative and reliance on the part of the dyer, which was a noted characteristic of the past generation. Under these conditions olive drab became somewhat of a monopoly, and under the old specifications the available dyestuff was narrowed down to one source of supply.

Tests Prior to War

We will pass over the specifications regarding stock, tensile strength, weight, etc., and confine our attention to the color tests. Prior to the war there were prescribed the following tests, and each lot submitted was expected to stand as well as the standard sealed sample furnished by the quartermaster.

Soap Test—The sample is to be boiled for ten minutes in a solution containing 80 grains of Ivory soap in one pint of water, then rinsed in pure water and dried.

Soda Test—The sample is to be boiled for ten minutes in a solution containing 10 grains of dry carbonate of soda in one pint of water, then rinsed and dried.

Lactic Acid Test—The sample is to remain immersed in lactic acid, U. S. P. (75 per cent) for 24 hours, then rinsed free of acid and dried.

Citric Acid Test—The sample is to remain immersed in a citric acid solution, which was about 10 per cent strength, for 24 hours and then rinsed and dried.

Light Test—The sample is to be exposed to the sun and weather for 30 days.

While the wording of these specifica-

tions does not follow the original exactly, the substance is the same. It is also understood that a different sample is used for each test and not one run through the whole series.

We can readily appreciate that the first two tests were intended to represent washing conditions, severe even for an army, in case the fulling and scouring in the mill had not been sufficient to remove the color or alter the shade. The two acid tests, however, are masterpieces. The citric acid was supposed to imitate the action of fruit juices in the tropics, and the lactic acid, it is said, represented perspiration. Both of these tests converted the wool itself into a hard pulpy mass that required a great amount of washing to restore its flexibility, and all dyes having a red element in their shade were decolorized, excepting Chrome Fast Reds G and R.

All the true alizarine reds, which were so much faster to light and washing, lost their color in a few hours and were not permissible under these tests. Some ordinary acid reds, which had no fastness either to light or ordinary washing, would stand the two acids indefinitely. Many reddish-toned chrome browns and all the chrome reds, except those mentioned, were more or less decolorized and caused the test to assume a greenish tone. In times of great need for the goods it was sometimes possible to use a few substitutes and have the goods passed, but the requirements were adhered to as closely as possible by the quartermasters. Shortly before the war a new standard was adopted for meltons, which, it was said, was dyed with vat dyes. The writer, having no first-hand knowledge of these goods, can make no further comment than to state that if the war had not cut off the supply of dyes and such a high standard had been insisted upon, we would have been entirely barred from the use of American dyestuffs.

Of course, we all feel that our soldiers should have the most serviceable goods obtainable, but when requirements are introduced that make the goods more expensive and necessitate dyeing processes that give colors that will long outwear the fabrics themselves, we naturally inquire for the reason. If the specifications bar all bidders on the contracts except a few, and such exclusion is not based on real merit, but on a technicality that involves the use of a proprietary dye that is not even made in this country, the answer to the inquiry is obvious.

This article was written by Dr. E. W. Pierce of the United States Conditioning and Testing Company, New York City, and appearing in The Chemist-Analyst.

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

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Quality Paramount if The American Dyestuff Industry Succeeds

NO matter how much progress is made in any direction we will always meet persons, who seem to be related to the pacifists, who will sneer and point out the small defects and tell of other wonderful achievements by our friends, the enemy.

The department store clerk has been silenced and he no longer chirps to each customer about the inferior American colors. The newspapers and trade journals have commenced saying nice things about our dyes and just as we begin to feel satisfied we hear a low growl from the dyehouse. If a dye is not right it is quite right for the dyer to say so, but will he not be fair enough to let the complaint stop there, and not add to his remark: "It takes the Germans to make good dyes?"

We have stated before, and it will bear repetition, that dyes made in this country are every bit as good as the same dyes made abroad. That is, it is quite possible to make them here and many factories are doing so, but there are unfortunately some instances that give good ground for the criticisms.

If a dyestuff factory is operated in the proper manner, with the best appliances that can be obtained and a force of technical and research chemists all under good business management, the result is a line of goods that are a credit to the establishment and to the country. When, however, men who have nothing but money obtain the services of a near-chemist and put together an imitation factory in which every principle of good management and common sense is disregarded, it is not surprising that the output will be the cause not only of complaints, but tend to throw discredit on the industry at large.

Everyone is familiar with the superiority of Swiss watches, just as we also know the famous Connecticut alarm clock. They both indicate the time of day and the alarm clock even does more, but who would attempt to put them in comparison? The difference in quality is not so much in materials as it is in the character of workmanship. One requires care and tedious workmanship and the output is small, the other requires only slight skill and the output is enormous. The same conditions apply to dyestuff manufacture and the great demand for quantity makes it a temptation to sacrifice the finer qualities; but in this case it does not mean that the quality cannot be obtained in most cases when the market conditions permit. There always will be factories turning out alarm clocks, despite the demand for Swiss watches, and there will be dye factories that will never rise above their present grade of goods; simply because they are incapable of it.

Let us consider Fuchsine crystals for

example. The factory gets as far as a strong solution of Rosaniline Hydrochloride and commences crystallization. After several weeks in the tanks the crop of good crystals is removed and under favorable conditions the yield may be 40% (a high estimate) while the remaining liquor and the residue must be depended on for the balance of the product. The later crops of crystals either require too much time to form or are so contaminated with residue that the process does not pay. As an alternative the whole liquor is evaporated and the mass broken up instead of being crystallized. The product contains insoluble residue, is dull and difficult to dissolve. This does not mean that Americans cannot make good Fuchsine crystals, it only means that market conditions at present will not permit of the proper care, time and expense. But bit by bit the inferior grades will be automatically eliminated by the general law of "the survival of the fittest," and in time it will be profitable and obligatory to furnish only first-grade crystals. They could be furnished today if the consumer would pay the extra expense, but as long as some factories are offering the lower grades at certain prices and the consumer uses them, there is little encouragement to produce the better product at higher cost.

This same condition prevails through a large series of dyes. Ayo dyes are generally free from defects of a serious nature, but all the triphenylmethane derivatives offer many possibilities of trouble, and unless the consumer is willing to pay for the extra work involved, there will be no improvement in quality as long as the demand is for quantity.

We could give many concrete examples of dyes that are not perfect, but that does not indicate that they represent the best that can be done at present. The dyestuff manufacturer does not control prices of raw materials, machinery or the cost of labor, skilled and otherwise and is not to be criticised if he cannot meet an arbitrary price. If he is forced by the market to meet any certain price that alone limits the amount of refinement that can be put into the product. The dyer or consumer must learn to appreciate these facts and then let him complain if he will—that is a matter between him and the manufacturer, but he has no right to say that "it takes Germans to make good dyes," that hurts the country at large.

Every just complaint by the user will improve the quality of the product and perhaps raise the general price a little as the inferior grades are eliminated from the market. Some of the factories are bound to go to the scrap heap as time goes on, but those that survive will improve as long as they are given a chance.

The development of this industry, like many others, is very much in the hands of the consumer, and if they do not assist it they will suffer accordingly.

Dyestuff Association Meeting Called for March 6th at the Chemists' Club

THE first meeting of the Dyestuff Association of America, as it will probably be called, will be held at the Chemists' Club, 52 East 41st Street, New York City, on March 6th, at 10 A. M. The interest that was awakened by the Convention which met on January 22nd and 23rd last was of such a widespread character and embraced such a large percentage of the aniline dye manufacturing and distributing houses, it is expected that this forthcoming meeting, at which the final organization will be completed, will be of an equally representative character.

During the interim between the Convention and this first organization meeting, the Committee on Organization has been busy discussing various questions which will be submitted to the consideration and decision of the Association, and the Sub-Committee on the Tariff will by that time have had its conference with the United States Tariff Commission in Washington, and will be prepared to report as to what encouragement will be given by the Government in the direction of a proper protection of the new industry.

The By-Laws have been drafted and will be put before the meeting for ratification or amendment, and a recom-

mendation as to the permanent officers of the Association will be made for the consideration of the representatives present.

This will be the time when the new dyestuff association will pass from the embryonic to the actual stage, and the work done at this first organization meeting will indicate the spirit and policy with which the organization will be conducted hereafter.

It is hoped that every manufacturer of dyestuffs and intermediates in the country and all the legitimate dealers and distributors of dyestuffs will be present at this meeting to take part in the decisions which will so vitally affect their interests, for in so far as this is done the permanence of the industry will be assured.

A New Vegetable Dye From India

Interesting developments in the vegetable dyestuff field are reported by the Department of Experimental Research in India. A discovery of particular note is that of sappan wood. It has been found possible to prepare the dyestuff in a commercial form soluble in water similar to an aniline color. Dyeing experiments have been made with the dyestuff on silk and a large number of inquiries are said to have been received for this dye.

Proposals are under consideration for its manufacture on a large scale by an outside agency working independent of the Government.

A New Fur Dye

A discovery of a new fur dye which will be called St. Louis dye is announced by Col. Philip Fouke, President of Funsten Bros. Fur Co. Members of the company declare this new dye to be the best fur-coloring matter ever known. Until this company had located their dyeing plant in this city almost all of their work was done in France and England.

A member of the company has declared that the plant now in operation in this country turns out about 300 skins a week, and it is expected that the output will be increased from 1,000 to 1,200 skins per week.

A Tribute to American Made Dyes

At the recent meeting of the Drysalters' Club, Mr. Hobbs, President of the Arlington Mills voiced the following opinion regarding American dyes:

> "So far as I know, out of the millions of yards of cloth that have been delivered since the American dyestuffs have been used, not a yard has been returned on account of any defect in dyestuff.
>
> "A year has gone by and I still feel as I have always felt that not only the American dyestuff industry should be developed by all reasonable means, but all American industries should be developed to the greatest extent.
>
> "I believe in America first, last and all the time whether in peace or in war."

If the other consumers of dyestuffs in this country are of the same opinion as Mr. Hobbs, then surely the industry can expect the hearty cooperation that is necessary to the industry's permanency.

Tests of Sulphur Dyestuffs

THERE is probably no class of dyes which cause so many difficulties in testing as the sulphur dyes. There are several reasons for the varying results and an understanding of the conditions is of great importance. A commercial sulphur dye, whether it be a black or a color is a substance in powder or paste, insoluble in water and requiring sodium sulphide to put it into solution. Every product of different manufacture has a certain proportion of sulphide which is most favorable and this varies also during the dyeing, according to the concentration of the bath and the amount of exposure to the air during the process. Commercial sodium sulphide, particularly the concentrated brands, is not true monosulphide but a mixture of polysulphides and requires the addition of caustic soda to prevent separation of sulphur. Then the amount of salt added to the bath varies with each distinct product. What is favorable to one is an excess or deficiency for another.

Therefore to test two sulphur dyes comparatively it would be necessary to know first the most favorable conditions of the dyebath. This can only be determined by numerous experiments which consume more time than is generally allowable. Another condition which exists is that a fresh sample requires less sulphide than one which has been kept longer. Old samples of sulphur blacks even show an actual loss of coloring power under the most favorable conditions and the same is very likely true of fancy colors.

So far no standard method of testing sulphur dyes has been adopted although the need is great. It is hoped that some practical suggestions will soon be forthcoming as it is important that we be enabled to keep a check on this class of colors as well as we are now able to do with the acid, basic, direct and mordant dyes.

Stabilizing Dyestuff Industry

Ways to Produce Most Essentials in American Plants—Capital Estimated at $200,000,000.

IN making any statement regarding recent developments in the American dyestuff industry, it seems in order to first mention what has been accomplished in 1917 in this field by our American manufacturers, says Mr. Charles H. Stone, of the National Aniline and Chemical Company, Inc., of New York.

The first of 1917 found the dyestuff producers of this country making a sufficient quantity of coal tar colors to meet the pressing requirements of our American dyestuff users, whatever their needs; the textile mills, however, still felt more or less dependent on the meagre quantities of the better grade imported colors for their guaranteed fabrics.

The first of 1918 finds a greatly changed situation. For comparison, a year ago there were very few of the better class direct dyeing cotton colors made in this country; to-day there are a number of these regularly available; then there was not a diazotizable cotton color to be had; to-day the number of shades which can be produced with available colors of this very valuable class is about a dozen; then the only sulphur color being made in commercial quantities was black; to-day all the shades of this series of very fast colors generally used before the war are being produced on such a scale as to meet the necessary requirements of the trade.

The year's developments in colors for wool dyeing have not been as noteworthy as in colors for cotton and silk dyeing, the evident reason being that at the beginning of the year 1917 this field was more fully occupied by colors of satisfactory fastness properties than in the field of cotton colors.

In this branch of the industry there have been notable additions, however, of very fast to light colors for dyeing dress goods, carpet yarns, etc., in a great variety of shades; a number of brilliant permanent chrome-developed colors used in dyeing the highest grade

of fabrics for men's and women's wear, and also a very complete series of colors for dyeing such specialties as unions, silk effect piece goods, etc., have also become regularly available.

KHAKI DOMINATES THE FIELD

The thoughts of your readers naturally turn to khaki when colors are mentioned; and they will be interested to know that about 40 per cent. of all of the woolen looms and 25 per cent. of all of the cotton looms in America are now weaving cloth for our Government, and practically all of the colors used for dyeing the production of these looms, whether cotton or wool, are made in America from American materials in factories owned and operated by Americans.

And just here a word of information for those who criticized the mottled effects sometimes apparent in the khaki uniforms of our splendid boys on parade last summer and fall: Some of the uniforms then worn were dyed with imported dyes of demonstrated inferiority, but now that all the uniforms in use have been dyed with all-American made dyes this cause of criticism has been overcome, and the colors of the uniforms being delivered to our soldiers to-day will demonstrate better than any other single fact the progress made in the American dyestuff industry during 1917.

Before passing from the year's achievements in the development of this industry, it should be stated that the needs of the silk, leather, paper, ink and other color-using manufacturers have not been neglected, and the same relative advances have been made in meeting their exacting requirements as in the other fields.

THE PROGRESS OF 1918

What progress will 1918 bring?

What I have said above applies to the business in America as a whole. In speaking of the developments of this year, I have naturally to confine myself to the organization of which I am a member. Conditioned upon our Government permitting us to use the necessary intermediates now or soon to be available, our company will make far greater progress this year than last in placing at the disposal of the American color users not only all the necessary colors they require, but many of the specialties they have been accustomed to use, thus removing the last excuse existing for the importation of any coal tar dyes into America. Putting this statement differently, in 1917 the American dyestuff manufacturers made as great progress as had the foreign manufacturers in any ten years; and barring governmental interference, our record for 1918 will better that of last year.

The field for American-made dyes seems practically unlimited. At least one of the companies has taken a commanding commercial position; its financial position is strong; its directorate is representative, and its selling policy is aggressive with numerous American branches, and a number of foreign connections, supplemented by its own traveling representatives now active in a number of the important foreign textile centers.

DYE CAPITAL ATTAINS $200,000,000

With a very large percentage of the known coal tar colors now being made in America, and these comprising practically all of the necessary colors; with an investment of $200,000,000 for producing colors and their intermediates; with the industry having entered the realm of big business, with big men at its helm; with the propagandist's paid-for signs of "Colors not guaranteed," so prominently displayed on every hand, discredited by the manufacturers' own guarantees of fastness, there remain but two questions before the American dyestuff manufacturers to-day — Can our Government let us have the necessary intermediates during the war? and will our Government give us the necessary tariff protection after the war?

Textile Show Coming

THE Textile Show to be held in the Grand Central Palace, New York City, April 29 to May 11, despite war conditions, promises to be the greatest exhibit of its kind that has ever been held. Although the exposition is three months away it is growing by leaps and bounds and the whole textile trade

seems to be awake to the possibilities offered.

It will be an international affair. The committee is now arranging to send out invitations in French, Spanish, Portuguese and English to Europe and to South America. These "bids" will be sent to the leaders of the industry and even though at this time the Dove of Peace has not shown any great strength, yet there is a feeling in the textile world that the big textile men in France and Belgium, who have had their mills either demolished or taken down and transported to Germany, will come to the Textile Show at the Grand Central Palace and order their material for the reconstruction of their mills. Spain, Portugal and South America are now looking towards this market and the big show will be an added impetus for these buyers to come to New York.

The Textile Exhibitors' Association are going to handle this international aspect in a big way. They have the co-operation of the New York Board of Trade and the Importers' Association and have every promise that there will be a great crowd of foreigners on hand. A staff of interpreters with a clerical and stenographic force will be established so that American manufacturers will have no trouble doing business with the non-English speaking buyers.

A committee of the Textile Exhibitors' Association are now at work on another department which has been designated as Department "D" of the Textile Show. This will be largely taken over by the silk, woolen, cotton and knit manufacturers of finished goods. There will be a Fashion Show with living models.

It is expected that these finished product manufacturers will come in in groups and that it now appears the entire industry will be represented.

General Manager Chester I. Campbell is quite enthusiastic over the prospects of it being the greatest show ever. He states that the textile machinery and mill supply folk are going to show a much more varied and comprehensive exhibit than was shown in Boston, which was a record-breaking show.

As a great many of the Textile Associations are meeting in New York City during the two weeks of the Show, the whole affair is taking on an atmosphere which even at this time marks the gathering of textile men of unusual importance.

Notes of the Trade

The American Synthetic Colors Company of Stanford, Conn., is planning for the construction of a large addition to its plant to provide for increased capacity. The structure is estimated to cost $30,000.

Organization papers have been filed by the Mayland Manufacturing Company, of Bloomfield, notifying of intent to operate a chemical manufacturing works at 71 Willet Street. Anthony J. Mayland heads the company.

For the purpose of increasing its capacity, and for the completion of a large Government order, the Calco Chemical Company, Bound Brook

Road, Bound Brook, manufacturer of chemicals, has commenced the construction of a large new addition to its plant. Frank N. Goble, 1 East Forty-second Street, New York, has the contract for erection.

The Butterworth-Judson Corporation, Avenue R, Newark, N. J., manufacturer of chemicals, has taken out a building permit for the construction of a new two-story addition to its plant, about 60x105 ft. The structure will cost $12,000.

A new one-story brick condenser house addition, about 40x60 ft., will be erected at the chemical manufacturing plant of the Maas & Waldstein Company, Avenue R., Newark, N. J. The company has taken out a building permit for the structure.

The Nitro Chemical Corporation, 20 Broad Street, New York, has recently acquired a portion of the local plant of the Canadian Car & Foundry Company, and is planning to commence immediate construction of about twenty-five new buildings, 60x400 ft., to be devoted to the manufacture of picric acid for the Government. When running to capacity, it is expected that the plant will have an output of approximately 800,000 pounds monthly of wet picric acid, which is used in the manufacture of hand grenades. About 4,000 hands will be employed. Contract for the construction of the new plant has been awarded to W. J. Burke, Lyndhurst.

Fire, on Jan. 12, destroyed a portion of the plant of the Roessler & Hasslacher Chemical Company, Perth Amboy, N. J., with loss estimated at about $25,000. The company has recently conveyed to the General Bakelite Company, manufacturer of insulation specialties, a subsidiary organization, property at Fayette and Rector Streets. It is said that the site will be used for extensions to the latter company's plant.

The Globe Rubber Tire Company, Trenton, N. J., is planning for the construction of additions and improvements at its plant to provide for increased capacity.

The Farmingdale Chemical Company, manufacturer of chemicals and allied products, has acquired the plant of the E. C. Nelson Manufacturing Company, Farmingdale, for a consideration of about $75,000, and is planning to operate the works for the manufacture of chemicals which were obtained from Germany before the war.

Government Demands Large Quantities of Dry Colors

The principal feature of interest in this week's trading of dry colors has been the large quantities that have been demanded by the Government. The shades for which the Government is in need are chrome greens and yellows and Prussian blues.

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MYRON DREW REESER, Managing Editor

The Tariff Question

HERE is a broad contention made by a prominent educator with which we heartily agree. It in a way answers the various and sundry arguments, inspired or otherwise, relative to the advisability and value of a representative organization among dyestuff manufacturers, or in fact any and all highly specialized industries.

Professor Jackson of the Chemical Engineering Department of Columbia University has this to say with regard to what may be called the war of chemists: "The enormous tonnage of explosives required," Prof. Jackson explained, "must be produced by the chemist. The chemist must also produce materials for bombing and gassings, and must furnish fuels for ambulances, autos and aeroplanes. The khaki color which makes the soldier's clothing inconspicuous is also the product of his handiwork.

"With proper legislation we can manufacture, on a competitive basis, practically every chemical product which we now import. Cheap labor is not a factor of importance. The final selling price of strictly chemical products imported into the United States annually before the war has been estimated at $250,000,000, of which not over 4 per cent. represents labor value.

"The Germans have for many years realized the necessity of furthering the work of the chemist and the chemical engineer for warfare," continued Prof. Jackson, "as well as for the necessities of industry in time of peace. They knew that by developing their enormous color establishments in peace time, they were producing factories which could be readily changed to explosive works in time of war.

"The fact that strong corporations are entering chemical manufacturing fields, indicates that capital feels a reasonable assurance that this country will further and sufficiently protect their interests after the war, in order that we may independently produce our own necessities and at the same time add new assets to the Nation's wealth."

Certainly we must all agree that this country must sufficiently protect such interests after the war and immediately the tariff bugbear shows its head. The most recent number of the tariff information series of the United States Tariff Commission is a pamphlet on "The Dyestuff Situation in the Textile Industries 1913 and 1916." In it are presented the results of an inquiry sent to 77 companies who are representative consumers of dyestuffs in the textile industries of the companies reporting, 23 were engaged in cotton manufacture, 25 in wool manufacture, 8 in silk manufacture, and 21 were independent dyers and finishers. The cotton manufacturers were the only group reporting the use of a smaller quantity of dyestuffs in 1916 than in 1913. A substantial increase as reported by the other groups would seem to indicate that by 1916 the domestic manufacturers of dyestuffs had made considerable progress in replacing foreign-made dyes with those of American manufacturers.

The increase in the costs of the individual dyestuffs is particularly striking. In some instances alizarin and anthracene colors were purchased in 1916 at prices 20 to 30 times those paid in 1913. The total value of all the dyestuffs consumed by the 77 companies in 1916 was approximately four times the value of the dyestuffs consumed in 1913. The greatest shortage occurred among the dyes which were not made in this country before the war, particularly in the case of synthetic indigo and the vat dyes from anthraquinone needed by the cotton dyer and the alizar in colors needed by the wool manufacturers. Vegetable indigo and natural dyes such as logwood and fustic came into importance as substitutes for the coal-tar

derivatives. American-made sulphur colors were given a wide application and certain gallocyanine dyes were developed to replace the imported alizarin and anthracene blue.

The opinion of the textile manufacturers as to the operation of the present dyestuff schedule of the tariff and their suggestions for changes to meet the conditions after the war,form what is perhaps the most interesting part of the report. These opinions, which are quoted without the indorsement, criticism, or comment of the Tariff Commission, indicate that on the whole the textile consumers of dyestuffs will give the new American industry the support and patronage that will insure its continuance after the war.

A Query Answered

Editor of DYESTUFF REPORTER:

Will you kindly ask your chemist how the following defect may be obviated. In dyeing woolen tops black in the Franklin Dyeing Machine we have dissolved Chrome Black in half a barrel boiling water, boiling it well to dissolve, this is then emptied into the tank of the machine, but after the operation of dyeing is concluded we find a gummy deposit all over the top layer of tops and also in the bottom of the Machine. The entire formula used is as follows:

6% Chrome Black
⅛% Mordant Yellow
5% Acetic Acid

Add 2% Acetic Acid, boil 20 minutes.

Add 2% Bisulphate Soda, boil 20 minutes, then run liquor off and wash; finish with 2½% Bichromate Soda, 2½% Lactic Acid; boil 40 minutes.

After-chrome blacks are particularly likely to cause much froth and to deposit a dark scum around the top of even an open kettle. The scum which would form on a yarn kettle would be caught, as in a filter, by the closely-packed wool and show on the outside. The use of 10% of Glauber salt with the dye is advisable. We would omit all acid until the liquor had boiled and circulated well through the wool and then feed it gradually. When the acid is added at first there is a tendency to accumulate on the outside of the tops, leaving the inside pale.

When the dyebath is exhausted use

only enough chrome to develop the shade. The average chrome black only requires 3/4%. The use of lactic acid only diminishes the action of the chrome and we would suggest its omission entirely. The chroming should take place in one-half hour, providing the circulation in the machine is perfect. Aim to use as little chrome as will develop the shade evenly, because an excess will cause a reddish tone. It is also possible to chrome tops in a machine by adding the chrome direct to the exhausted dye liquor and omitting the washing until later. Often it is necessary to feed the chrome while running to avoid over-chroming the surface and having the inside undeveloped. Such a condition will give a reddish black after gilling which is not fast to washing while an even chroming gives a full black shade fast to all requirements. If these suggestions do not correct the trouble you should call the attention of the manufacturer of the dye to the case or try the product of another factory.

Chrome or Mordant Dyes

The supply of chrome or mordant dyes is fairly satisfactory. There are many made in this country and some imported from France, Switzerland and England. The true alizarines are rare and most of the dyes sold under that name are azo dyes. This is no detriment as many of the chrome colors are even superior to the true alizarines in some respects, especially in their dyeing qualities, such as leveling and penetration. Many are capable of being dyed in three ways, viz., chrome mordant, after-chromed and chromate or metachrome processes. After-chroming has never been as popular as the other processes because it is not so easy to match shades on account of the changes that take place after the chrome is applied. After-chrome colors are probably the best for yarns because the long boiling necessary to the other two methods is likely to cause felting and tangling.

The metachrome process, patented by the Berlin Aniline Works, and the chromate process, Cassella, add bi-chromates with the dye and by the gradual increase in temperature and addition of acid, either directly or by decomposition of ammonium salts, the wool becomes mordanted first and the dye then unites with it on the fiber. Only such dyes as will not precipitate in the cool bath will dye in this way. The processes were considered as great achievements and became very popular, but it is a well-known fact that over twenty years ago the essential features were to be found in a line of "one-dip alizarines" put out in paste form in Boston. The greatest drawback of one-bath chrome dyeings on pieces is that the free chromic acid is seldom reduced entirely or has exerted its full effect at the time the goods are removed from the bath, and when the piece is steamed, a further action takes place at the inside of the roll and a shading, or cloudy effects result.

The remedy is to finish with a little formic acid in the bath and insure the reduction of the chromic acid to a green chromium compound. If the dye will stand it a small quantity of sodium bisulphite would be more effective and

much less expensive. Many of the one-bath chrome dyes as well as the after-chrome colors will leave silk effects white, and practically all will leave cotton and artificial silk unstained. Both classes of dyes should be tested out separately and their working qualities studied as some, particularly the blues of the Chromatrope series, may require a much larger amount of chrome than usual to develop the final shade, and if the color is not fully developed the fastness will suffer and further changes in shade may be expected during steaming or even during pressing by the tailor.

Dyeings on Chrome Mordant

Dyeings on a chrome mordant need a few words of comment. If we are using a true alizarine in insoluble condition, or one made soluble by combination with bisulphites or other classes of dyes such as gallocyanine, which are often bisulphite compounds, we may only use a chrome mordant which has no oxidizing power. The non-oxidizing mordant is always greenish-blue in color and never has a trace of yellow. A yellowish chrome mordant contains some chromic acid and will cause a loss of coloring matter by oxidizing it in the bath. The precipitated color lake which is formed may remain in a fine colloidal condition and affix itself loosely to the fiber, giving later the appearance of a perfectly exhausted dyebath, but the goods will lose color in washing and generally crock.

One does not need to be so particular in using the ordinary dyes on a chrome mordant because most of them have the one-bath dyeing quality and will affix themselves to the wool rather than precipitate in the bath. To make the non-oxidizing mordant a strong reducing agent it is necessary to use with the bichromate. There is a scarcity of these at present and while formic, oxalic and tartaric acids could formerly be used, we can still obtain lactic acid. As a large amount must be used to obtain complete reduction in a reasonable length of time, the expense is likely to be too great. We can, however, adapt the Amend process with a considerable saving in time and cost. The original process, patented over twenty years ago, worked the wool first in chromic acid (sold in crystal form), then in a cool bath of sodium bisulphite, which gave a complete reduction. We may charge the bath with 2 to 3 per cent of bichromate of soda and an equal amount of sulphuric acid, but as the acid causes the mordant to take on rapidly it is well to arrange to add the acid slowly after the wool is well wetted out.

Boiling causes a slight reduction at the expense of the wool itself but this also tends to cause a better penetration into the fiber substance. After twenty minutes or a half hour boiling the steam may be shut off and about 2 per cent of the commercial solution of sodium bisulphite slowly added so every part of the wool may be equally acted upon. The first change that takes place is the formation of chromium chromate, a yellowish brown color that compares with the reduction caused by tartar. Then in a quarter hour's time add slowly enough bisulphite to complete the reduction and give the desired greenish-blue color. The exact quantity cannot be calculated as it varies with conditions, but an ex-

cess does no harm and is removed in the rinsing that follows. Such a mordant is fast on the fiber and has no power to precipitate the color anywhere but on the wool. It is less costly than the regular methods and leaves the wool in softer condition. Another peculiarity that is remarkable is that cotton specks and threads also take on some of the mordant and some of the color during dyeing, and while never of a full shade do not show conspicuously.

A chrome mordant less reduced may also be made in this manner by the use of less bisulphite. As the stripping and fixing of colors on shoddy and rags is generally done by chrome and sulphuric acid, a final treatment with bisulphite will convert it into a satisfactory mordant for fast colors as well as for dyewood extracts.

Fading by Ultra Violet Rays

The light or exposure test is necessarily a very variable and uncertain test at the best and we are glad to see that now there is a stronger movement in favor of the ultra violet exposure, some of the Government departments, at least, having recognized its value and saving of time. The opposition to ultra violet rays as a substitute for sun and weather are prepared to show that many dyes vary in their fading by both methods and that no exact ratio is possible for all colors. These facts cannot be disputed, but the same reasoning applied to sun and weather would lead to still worse confusion. The sun gives out with its light and heat a certain assortment of short rays in the ultra violet region of the spectrum, which do not pass through glass, cannot be reflected nor refracted, and which act on moist air, producing ozone, oxides of nitrogen and hydrogen peroxide. The intensity of the sunlight and the relative humidity, varying from day to day, make an exposure test a very irregular matter. We can never tell whether the loss of color, which we call fading, is due so much to molecular disruption from the short rays of the sunlight as to a real bleaching action or oxidation. A comparison of a dry sample under glass would also give uncertain results as most of the active rays are kept out by the glass.

Ultra violet rays, produced by an effective apparatus, on the other hand, give an assortment of short rays that may differ from the sun's assortment just as the light from a mercury vapor lamp differs from gaslight. The quality of the rays do not differ, but there is a somewhat different proportion. Work is under way at present toward the charting of the short invisible rays, which cover quite a distance beyond the last visible violet, but until we get more information the work of testing fastness to light will be somewhat empiric.

The fact remains that the short rays do fade dyes, that the source of light, moisture and time can be exactly controlled and, having once exposed a standard, subsequent tests can be subjected to exactly the same conditions. As the sample soon becomes dry, all action of the bleaching agents may be disregarded. Having once determined what is a satisfactory period of exposure this can be repeated with new samples at any time.

A description of a satisfactory form of apparatus will be in place here. The lamp proper, which is covered by the

hood, is a tube made of transparent quartz, made ¾ x 7 inches, with a well or depression at one end, containing mercury and a perfect vacuum being necessary to perfect operation. The leading in wires and anodes are tungsten, but otherwise the operation is similar to the ordinary glass mercury vapor lamps used by photographers and others. This lamp is on a 220-volt circuit, but when in operation registers about 170 V., 3½ A. There is a great increase in the number of short rays at this higher voltage and while the ordinary lamp used by physicians can be viewed by the naked eye, a lamp of this type will cause, in one second, an acute inflammation of the eyes lasting three days. Fifteen seconds exposure of the face, with the eyes protected by amber glasses, caused a reddening of the skin to develop several hours later, which was identical with sunburn.

The samples to be exposed are about 18 inches below the tube and must be protected by metal, as the rays penetrate slightly through cardboard. White wool is somewhat yellowed and the regular mixture for olive drab loses its mixed appearance during exposure as the white changes. From a number of tests it was computed that the exposure under the lamp shown had a value very close to eight times that of sunlight, or roughly one hour under the lamp equalled an average day's exposure. However, in such tests as have been ordered by Government departments, the orders have been for 48 hours' exposure, which will fade the majority of dyestuffs.

If the ultra violet exposure is to be made an official test, it will be necessary to standardize it more closely. All lamps differ in power according to the voltage supplied and to the automatic resistance in their control. As the lamps age, the devitrification of the quartz, the deposit of tungsten oxides, and the loss of vacuum by leakage, cause a lessening of the radiation. These features are being studied now at several laboratories and the results will have much to do with making this an official test. As there is a great difference in the power of different lamps at the outset, and as all lose some of their intensity by constant use, it can be easily seen how much variation is possible in comparing the work of several observers. As soon as we are able to measure ultra violet radiation it will be possible to compare results made under different conditions at different times. Attempts to use photographic printing paper are of little use, because there are many rays that are visible and pass through glass which affect it as well as the ultra violet rays, and moreover the action is very rapid and prevents an accurate measurement. The most promising methods are those which depend on the liberation of a gas from a liquid contained in a quartz tube when exposed to the rays, but such methods have not yet been worked out for practical use.

Stock and Piece Dyeing

Naturally, when one sees so much of one color as we now do of olive drab there is also a tendency to reproduce it in all classes of goods. On one hand, there are the knitting yarns made from all grades of stock, from worsted down to the lowest grades of shoddy and noils, intended for ultimate use by the soldiers, and on the other hand the finer cloths for ladies' dress goods and various accessories brought into being by the military tendency of the fashions. A sharp distinction must be made between the shades that are the result of stock dyeing and mixing, and those which are yarn or piece dyed in solid shades. For stock dyeing we require fastness to scouring and often to fulling against white and fastness to light generally accompanies these qualities. For yarn and pieces the chief requirements are level dyeing, penetration, and, if possible, fastness to light. Fastness to light in easy leveling piece dyes is now out of the question with acid colors.

We can obtain Tartrazine and the American equivalent of Sorbine Red, but in place of the Alizarine Sapphirols we must use Acid Blacks or Indigotine. While Patent Blue and Fast Acid Violet 10B are now made, the supply and price puts them beyond the reach of this class of work. The dye-baths are worked with sulphuric acid and Glauber salt, the predominant color is the yellow, with a lesser quantity of red and only enough blue to darken the shade. It is not possible to give exact recipes at this time on account of the great variation in

shade and strength of the dyes now being offered, but, with the experience acquired in the past few years, any dyer will be able to get the desired shade with the colors noted above. To get the necessary fastness to light is not possible with acid dyes, but we must use chrome colors.

Regarding Shades

The dyer aims to get two shades, a full golden brown with a lively yellow overtone and an olive green with a yellow overtone. The shades must not be flat but will require at least 2 per cent. of a strong Alizarine Yellow as a basis, with possibly ¼ per cent. of red and ⅛ per cent. of black for the brown, while for the olive green the red is halved and the black doubled. The dyebath is started cool and the heat gradually increased while the wool is well worked and when the boiling point is reached the boiling continues for an hour. The bath has had no additions but the dyes, but some prefer to add 10 per cent. of glauber salt, to favor evenness and penetration of the fiber. After an hour's boiling, 5 per cent. of acetic acid is added and the boiling continued ½ hour longer, then a final chroming with 2 per cent. of bichromate of soda follows in the same liquor. This develops the color to its full extent, but also strips the black and often produces a redder effect than was expected.

As some free chrome would be left on the stock, this is likely to turn green from its later reduction and so alter the shade it is usual to add a little formic acid to complete the reduction in the bath. It is likely that here also bisulphite of soda would be equally efficient. A thorough rinsing and drying follows. The whole process has consumed about 5 hours, counting time of loading the kettles.

The two shades are kept separate and are later mixed for spinning. A typical mixture consists of about 4 parts of brown, 3 parts of green, 2 parts of yellow and 1 part of white. A small sample mixing is made and carded, then a pad is scoured and rubbed by hand in soap until well felted, then rinsed and dried. The pad may be compared with the sample of cloth to be matched and any tests applied before going into the actual manufacture of a large lot. It is only by these precautions that success can be hoped for because one may have the proper dyes and process and yet find the sample pad to fail, and instances have been known of the regular work of the mill to suddenly show defects through a slight oversight in one of the earlier stages.

Cotton to be used in such fabrics as permit of the admixture of cotton must be dyed with sulphur colors. The va-

riety of sulphur dyes now obtainable is not very great, but most of the shades used are only combinations of yellows, preferably of reddish shade, and black. The color inclines more toward the olive green but as long as the cotton is well covered almost any tone will answer and allowance can be made in the mixing. The sulphur dyebath is generally a standing kettle and for each lot dyed sodium sulphide and soda ash is added. After an hour's boiling it is best to throw the stock on a drain board and permit of an oxidation for an hour or two before rinsing. Rinse thoroughly several times as there is a danger of fires in the dryer if any sulphur compounds remain in the stock, particularly with low grades of cotton.

Abstract from analysis written by Dr. E. W. Pierce for the Textile World Journal

GET TOGETHER

Duty to the commercial prosperity of America demands that
You conduct this business with a view to
Establishing this industry on a permanent footing.
Standardizing of your products is of vital importance
To the success of your individual efforts, but
Until there is a spirit of cooperation evident, the
Fruits of your toil will yield nothing toward
Fortifying the industry against the invasion that threatens.

Antagonistic feeling among individual manufacturers increases the
Secretiveness that retards the progress of the industry.
So let us meet together as real Americans and
Overcome the possibility of over-production by
Cooperation of manufacturers and sales representatives and
Inject into the industry that spirit of good-will which
Alone can dispel the effect of selfishness and
Turn our attention to "thoughts of the 'morrow" so
In that moment when competition does come, we can
Oppose against its progress a bulwark of consumer faith that
No propaganda can threaten and no methods change.

On your individual actions rests the possible
Future of the industry—a permanent success for America, or

A camouflage of plant erection for consumer misleading.
Might we not expect more Governmental cooperation if
Each manufacturer informed those in authority, as
Readily as he in the past informed the consumer, regarding
Interesting developments in his ***own plant*** and then
Could the manufacturers ask—even demand—that
American commerce be protected from Teutonic invasion.

—*M. D. R.*

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

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The Embargo Menace—Orient Offers a Relief Market

WHILE the past two months have been marked by a period of inactivity in the dyestuff business, it was expected at this time of year. But, at the same time, there have come two serious setbacks that were not expected. It was not easily foreseen that a period of record-breaking cold weather would tie up the coal movement of the eastern states and hamper our exports, and the export business in American dyes had attained a size that was hardly to be believed by the country at large.

In the midst of the tie-up the exporters to Spain found that they could no longer obtain export licenses from Washington, and last week the final blow came in the shape of a general import and export embargo.

At present it has not been definitely stated how far the President will exercise this new power but we must prepare for the worst. How is the full force of this new order going to affect the dyestuff industry? First the curtailment of all direct exportation of finished dyestuffs and intermediates will at once result in an overproduction and a general break in the market. Those manufacturers who have their raw materials and intermediates bought on contracts will not be able to reduce their costs of manufacture to meet the new conditions, while the small manufacturer who buys spot lots may be able to meet conditions. If the new ruling does not go into effect at once, but hangs over like a menace, it will cause the trade to reason along just such lines and produce a very bad effect on the market unless a remedy is provided.

The mills or consumers of dyes in other lines will also lose their export trade and lessen the demand for dyed goods, which will also react on the producers of dyes.

Fortunately there is a way out of the difficulty without interfering with the movement of troops and munitions. There are in the Eastern states at present, and particularly in New York, the representatives of a large number of Japanese and Chinese houses who are here as buyers. The export to these countries would be in a direction that could easily utilize the empty cars that are now going West and the Pacific Ocean traffic is also free from troop ships and submarine menace.

It is hoped that the embargo will not be extended to the Pacific and we may thus be enabled to develop an Oriental trade that will, in a measure, compensate for the loss that must result as a sequence of the new regulation.

There always has been a good demand for aniline dyes in Oriental countries, but the trade was in the hands of the Germans. The early days of the war furnished us with a supply of dyes from these sources, always in small

tins. Now we are in a position to capture this business for America if we adopt the right tactics. The right tactics are easy to learn and simply consist in giving the customer a square deal. The Japanese and Chinese, being unfamiliar with our methods, seem to be legitimate victims for the sort of business deals that have thrown so much discredit on the dyestuff business in the past. But have the wise ones noticed that their opportunities are becoming less and less? There is a kind of mutual protection spirit among the Orientals, and it might surprise some of the dealers to hear themselves discussed in open meeting and the warning passed to avoid any business relations with them.

The opportunity for some good business in this time of need is right before us. A new dealer may succeed in some questionable transaction, once only, and then find that he is afterward shunned by all of his victim's fellow countrymen, which means that the reputable houses are going to get all the business of the future.

It does not take an Oriental long to learn a new game, and when he learns it he is not to be judged by his dress and speech alone.

This western outlet for our productions is a necessity, and will need our best attention. Washington must be made to see the possibilities of it and not hamper it with unnecessary restrictions. Our dealers must realize that they are dealing with a very keen and sensible race of people who are slow only in forgetting an injury. By understanding these conditions, it will be possible to establish substantial business relations that are likely to endure long after peace is declared.

Blue for Navy Test

ONE of our readers informs us that he has successfully used the American equivalent of sulphon cyanine 5R, dyed by the mono chrome process, and obtained navy blues that stand the navy soap test. We have not had an opportunity for further corroboration, but will have tests made in the near future. Up to this time it has been considered that gallocyanine on a chrome mordant was the only available dye. The correspondent also adds that he can make the same shade with hematine, and that it will stand the soap test. This is quite true, but the navy has other tests besides the soap test, and any logwood present would be barred by the other restrictions.

Revival of an Old Dye That May Be of Great Interest

AN American factory is commencing the manufacture of resorcin green, otherwise called Alsace green. This is a dull sage green which dyes on an iron mordant, giving shades very fast to light and washing. The dye itself is not a very beautiful shade, but its shading possibilities fill a present need. Iron buff on cotton, made with nitrate of iron liquor, lacks the greenish shade that would make it a good khaki. A slight tint of the new green gives a true khaki shade without the complicated process of using chrome and copper salts. The shade made on wool by the same process is too flat, but for cotton, duck, etc., there seems to be a good outlook.

What Methods May Be Used in Testing Dyes Used in Paper Coloring?

THERE is no difference in testing dyes for use in paper mills from the methods used for textile purposes. Acid colors may be dyed on wool or silk, basic dyes on silk or tannin mordanted cotton and direct dyes on cotton. Also we may use colorimetric methods if the samples represent identical products. In addition to the textile tests we may also dye paper pulp. The first step is to have a quantity of white unbleached sulphite pulp well beaten, then squeezed as dry as possible. A portion of this is weighed and dried to constant weight in an oven to determine the amount of moisture. The remainder of the pulp is shaken in a bottle with water to disintegrate it and then diluted so that each 250cc will represent 5 or 10 grams of dry pulp.

In making tests a sample of 100 milligrams of dyestuff is dissolved in the

smallest possible quantity of water and added to the beaten pulp. The mass is well beaten with a glass rod until no white flakes are visible. Any necessary mordants such as alum or sugar of lead are added and the beating continued. As an alternative, the test may be made in a glass-stoppered wide-mouth bottle or pint fruit jar and shaken by hand. The colored pulp is then poured uniformly on a fine brass screen and gently shaken. When most of the liquid has run through a piece of clean wool felt is laid on the surface and slightly pressed down. Then the screen and felt are turned over on a table and tapped, when the loose sheet will adhere to the felt and leave the screen. Another felt is placed on the pulp and the whole placed in a letter press or even run through a clothes wringer. After squeezing, the felts are removed and the wet sheet removed and placed between two clean press boards and again put in the letter press. After an hour or two it may be removed and pressed with a flat iron, and when dry trimmed square and labelled.

The process may seem tedious, but is really more simple than textile dyeing, and does not give uneven results unless the dyes contain insoluble matters or are affected by heat. This is the only way a satisfactory dye test can be made for ultramarine or soluble Prussian blue. Naturally means must be taken to have the dye fixed on the fibre. Basic dyes need no attention, but acid dyes require a mordant or precipitant, such as alum or lead acetate. Direct dyes may require heating. The use of sizing in the pulp is not necessary.

Ink Tablets

CONDENSED ink tablets may be made by mixing 3 parts of acid black with 1 part powdered gum Arabic and compressing into tablets. It is also possible to use nigrosine instead of acid black, but the tablets are not as soluble. They are simply dissolved in warm water, one tablet to an inkwell. A few years ago such things were ridiculed, but now the larger ink manufacturers are making them, and they are carried by soldiers and travellers.

An interesting ink powder may be made from powdered hematine, soda and a little bichromate of potash. Warm water converts it in 15 minutes into a fast ink that will not wash off the paper.

Of course, eosine is still used as the basis of red ink. It should contain some gum Arabic and a trace of both soda and salicylic acid.

Blueing for Paper Makers

BEFORE the war a special indanthrene was made for paper makers, and furnished a fast blueing. There has been a dearth of this for some time and ultramarine will not fill the demand. Soluble blue (not soluble Prussian blue) might be used if fastness were no object, and the same is true of mixtures of methylene blue and methyl violet. Many of these blues actually turn pink after a time and cause the white paper to appear worse than if it was not bleached. There is some indigo on the market, but it should be in a very finely divided condition to be

available for paper tinting. If the indigo, after grinding, is reduced by hydrosulphite and allowed to oxidize slowly, it will become a very fine precipitate and lose its gritty nature. As indigo is the only fast blue now available, it seems the paper maker's only hope until we have American indanthrene.

A Plea for Organization

ALTHOUGH the aniline dye industry has prospered since the autumn of 1914, it is not yet established on a firm basis. Before the war there were only five dye-making concerns in the United States. To-day there are more than 200 manufacturers and dealers. More than $200,000,000 is represented in capitalization. Proper organization seems to be the one step necessary to a bright future for this industry.

Makers of and dealers in American dyes will soon meet in New York to regulate undesirable conditions, and to effect a standardization of colors, contracts, credit, etc. At present such manufacturer has his own standards of color and his own phraseology. As a result, there are some 2,000 disputed cases relating to dyes now before the courts of New York state. By an exchange of views, the makers and dealers, it is expected, will be able to transform the existing disorder into a system that will lessen the number of misunderstandings, and that will make the transaction of business more pleasant and profitable to all concerned.

The convention probably will ask for a governmental standard of concentration. This measure is wanted not only for domestic convenience, but as a Protection against foreign competition. The Germans, for instance, sought to arouse dissatisfaction with American dyes, by sending in the German merchant submarine *Deutschland* dyes of four or five times the concentration ordinarily used.

The Government certainly should do all that it can do to prevent the dye industry from succumbing to foreign competition after the war. A good deal of courage was needed to embark in this industry, with no guarantee of Federal Protection. The development of the manufacture of aniline dyes relieved what had promised to be a most embarrassing situation. It will be unfair to certain manufacturers, and unwise as a national policy, if Germany is allowed to recover her absolute domination of the dyestuff market.—Rochester (N. Y.) *Democrat and Chronicle.*

Really An Obligation

FROM time to time there have appeared in our papers rumors and statements as to the German policy with their dye industries, when the war shall have been ended. Announcements have been made, says a correspondent in the New York *Times,* that the dye trade would be regained by selling its products in the United States at a price materially below the home cost. This was to be accomplished by subsidies paid to the German manufacturers by their own Government. It is, therefore, apparent that our manufacturers must compete with goods sold below their cost of production, but against which we shall have a certain Protective Tariff.

As the German Government, which has acquired a reputation for crafty dishonor, can adjust its subsidies with far greater ease and elasticity than we can regulate our Tariff, it is self-evident that if we intend to build up a permanent dye industry we must faithfully Protect to the utmost those who are willing to engage in this, a comparatively new work for us. It is the country's duty to see that as many home industries as possible be started to give employment to the workmen, now engaged in munition factories, who will cease working on war supplies when the war is ended, and to our soldiers on their return to civil life.

It is manifestly unfair to us as a nation and as individuals that any foreign Government be permitted to send goods into this country that are priced far below their cost, by reason of any Government's aid, which has as its object a definite plan to undermine and ultimately defeat projects of ours to establish new and self-contained industries.

What we need is a law, sweeping in its provisions of purpose, which will prohibit the importation of all goods which have a subsidy from any foreign Government or aid from an organization of individuals, to enable such goods to be sold below their cost.

It may be claimed that foreign subsidies can be given without our knowledge; but if the law provides a penalty of confiscation and complete future prohibition of importation, it is likely that this will take care of itself, for the United States is well able to get any and all needed facts.

When such a law is passed, our manufacturers can feel confident of their Protection on definite lines and need not face the uncertainty and danger of unfair competition. The time to act is now. There will be many problems affecting our trade and manufactures when the war ends. By being ready in advance for such perils as this, we can defend our home industries in peace, as we shall our country's liberty in war.

We owe this law to our workmen, whom it is our duty to Protect; and by shielding them we benefit ourselves. This is but just.

The Times Replies

"THE Tariff Commission has completed its careful and thorough inquiry concerning the use of dyestuffs in our textile industries. Seventy-seven manufacturers gave information about the quantities consumed before the war, the effect of sudden withdrawal of foreign supply, the output and quality of new American dyes, and the demand for support of those who have invested much capital in the production of them. Our nation may justly be proud, the investigators say, of the dyestuffs industry's rapid development. The Commission has repeatedly shown an earnest and friendly interest in its growth and welfare.

"In a letter to the *Times* a few days ago, as quoted above, the correspondent spoke of reports that the German manufacturers after the war would attempt to regain their old trade here in dyestuffs by selling below the cost of production, and would be enabled to do this by Government subsidy. In competition with dyes thus offered at prices below cost our new industry, which should be supported and preserved, would have only the defense of the present tariff duties, which are low. We quote from the letter:

> It is manifestly unfair to us as a nation and as individuals that any foreign Government be permitted to send goods into this country that are priced far below their cost, by reason of any Government aid, which has as its object a definite plan to undermine and ultimately defeat projects of ours to establish new and self-contained industries. What we need is a law, sweeping in its provisions of purpose, which will prohibit the importation of all goods which have a subsidy from any foreign Government or aid from an or-

ganization of individuals to enable such goods to be sold below their cost.

"We already have a law designed to prevent the importation and sale of foreign goods at prices below the cost of manufacture and transportation. Producers of dyes in Germany are closely combined. Such associations have been approved and assisted by their Government. If it should appear after the war that ability to sell German dyes abroad at very low prices has been gained by subsidy, the law will still be effective. All the facts will be ascertained by the Tariff Commission, which will recommend additional legislation if this statute is not sufficient. We think it will be, although some readjustment of tariff duties may be required. The Commission, which desires that the new industry shall live and grow, will be on guard. A law aimed specifically at foreign subsidy aid is not needed. No inclination to permit the wrecking of our dyemakers by Germany will be shown by consumers, Government commissions, or the American people."

From Over There

IN spite of dye difficulties, says a London contemporary, there is a wonderful choice in colors for the coming season, and those anxious to obtain reliable and accurate information on this all-important subject should make a point of seeing the well-arranged and comprehensive card of the latest shades issued by the ribbon manufacturers of St. Etienne and the silk manufacturers of Lyons. This interesting standard card is procurable only from Messrs. A. Fournier and Co., of 80 Watling street, E. C., this firm being the sole distributors for the United Kingdom.

The card sets forth some 144 shades, all the many gradations in the latest blues, greens, pinks, coppers, browns, greys, limes, lilacs, and tans being shown. Though many vivid tones are to be seen on this card, they will be utilized chiefly to provide effective touches of color to the neutral and sombre tones of grey, putty, tan, etc., which will be so largely used. There are some charming new shades in greys, including pearl, silver, slate, and cinder, and fresh gradations are noticeable in the putteys, moles and tans.

In the brilliant colors, jade green is still prominent, whilst other fashionable vivid shades taken from precious stones are cornelian, topaz, and emerald. Navy blue, as usual, holds a leading place, but in addition there are some wonderful tones of blue which are being employed, such as the new varieties of china blue, nattier, Sévres, and sapphire.

The deeper pinks, terra-cottas, and orange and copper reds are used with very successful and striking effect in conjunction with some of the new greys and blues. Novel alliances in shades are indeed a very interesting feature of the new frocks and millinery, and are giving delightful airs of distinction to many hats and garments. Naturally, the war has influenced the christening of some of the latest tones, and those known as "Uncle Sam" are sure to be well patronized.

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Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

MYRON DREW REESER, Managing Editor

Result of Tariff Commission Research

A RECENT report of our Tariff Commission has come to hand and contains considerable data which should prove of vital interest to everyone interested in the growth and stability of the dyestuff industry in America. The report opens with a very courteous tribute to the enterprise and initiative already shown by American dyestuff manufacturers. It goes on to say that the manner in which the situation has been met and the rapid development of the dyemaking industry in this country is a source of national pride. The analysis further emphasizes the fact that the textile industry is the best customer of the dyemaker and a large proportion of textile products is dependent on color for salability. Nearly all silk goods require color, as do most of the wool goods and probably two-thirds of the cotton goods. The point is also made that the cotton and wool industries account for the greater part of the textile consumption of dyestuffs, the amount needed for silk or other textiles being comparatively small. This is largely due to the relative size of the industries; according to the census of 1914, this country manufactured over five times as much cotton as wool, and over twenty times as much wool as silk. In the amount of dyestuffs used per pound of material, the wool industry averages the highest, for only a small proportion is sold uncolored.

In the cotton industry a substantial proportion of the goods is marketed in the bleached or unbleached condition. Many cotton prints and stripes require very small amounts of color per yard or per pound and even in piece dyeing a pound of color is, in some cases, sufficient for the tinting of several hundred pounds of cotton. We believe our readers will certainly be interested in the consensus of opinion obtained by the Government through a specific query sent to a representative list of manufacturers, and in this issue we will take up the result of that research so far as cotton alone is concerned.

Cottons

The manufacturers of cotton goods were more seriously affected by the dyestuff shortage than the other textile manufacturers, because they required large quantities of synthetic indigo and of certain other vat dyes, which were not made at all in the United States prior to the war. The returns from the 77 companies considered in this report, show that the cotton mills were the only branch of the textile industry which used a smaller quantity of dyestuffs and chemicals in 1916 than in 1913. Table 2 summarizes the data for the consumption of dyestuffs and chemicals in 1913 and 1916 for 23 representative companies. Separate totals are given for the 12 principal coal-tar dyestuffs used in the cotton industry and for seven vegetable or natural dyestuffs which, although relatively unimportant before the war, are now valuable substitutes for the coal-tar derivatives. The 19 dyestuffs for which separate data are given represent 70 per cent. and 71 per cent., respectively, of the total quantity of dyestuffs used by the 23 establishments in 1913 and 1916.

A decrease in quantity consumed during 1916 as compared with 1913 is noticed in the case of every coal-tar dyestuff except sulphur black and sulphur brown, which are being produced in large quantities in this country. Synthetic indigo, the dyestuff used in largest amounts by these cotton manufacturers, showed a decrease of about 65 per cent. This decrease was more than offset, however, by the use of almost a million pounds of vegetable indigo. The natural product contains considerably more indigo than does the synthetic article in the marketed form of 20 per cent. paste, and, therefore, commands a higher price. Estimated on the price

basis, the 963,500 pounds of vegetable indigo would be equivalent to 1,670,000 pounds of synthetic indigo and would increase the total quantity for that dyestuff in 1916 to over 3,000,000 pounds. Most of the other natural dyestuffs show a marked increase. In 1916 twelve times as much fustic extract was used as in 1913, probably because this dyestuff has become a valuable substitute for certain yellows and browns of coal-tar origin. Logwood, which shows a greater increase in the average price per pound than any other natural dye, is now used in mixtures with other dyes, as a substitute for synthetic indigo.

There was a remarkable increase in value for all of the dyestuffs, even the sulphur dyes which are made in large quantities in the United States. The increase in the total value of all dyestuffs used by the 23 establishments amounted to 241.5 per cent. notwithstanding the fact that there was a decrease of 11.8 per cent. in the total quantity consumed.

In response to an inquiry as to the scarcity of important dyestuffs in August, 1917, the replies mentioned: the vat dyes derived from anthraquinone, principally the blues, but also browns, blacks, yellows, violets, pinks, and reds; synthetic indigo; sulphur blues and greens and some sulphur browns; and a large number of standard German dyestuffs which have not been produced on a large scale in this country, such as primuline, sulphur yellow, direct Erika pink and benzopurpurine.

Answers to questions concerning substitutes, either natural or artificial, for dyes of which there was a scarcity are summarized as follows: Synthetic indigo has been substituted by natural or vegetable indigo or by various mixtures of logwood and vegetable indigo. Indigo is sometimes used instead of vat dyes derived from anthraquinone and carbazol, but most dyes of this type are still without satisfactory substitutes. Fustic extract and various American-made sulphur browns have been substituted for the imported sulphur yellows and browns. Sulphur black and various sulphur browns of domestic production have replaced former brands of

sulphur dyes and are being used as substitutes for direct azo colors. Paranitraniline when used with beta naphthol forms an acceptable substitute for the developed reds.

The opinions of seven representative cotton manufacturers as to how American-made artificial dyes compare with imported dyes of the same class are quoted below:

"American-made colors are improving but are still very inferior to the old imported dyes and are beyond comparision higher in cost."

"In the beginning American dyestuffs were far from satisfactory, but we are now producing some colors, such as sulphur black, that prove to be very satisfactory."

"The sulphur black is just as good and while the other colors are not as good, they answer the purpose for which we use them, although not as fast, nor as uniform in shade."

"Fastness seems equal for some classes of dyestuffs. Uniformity not quite as good. These remarks apply only to the better grade of domestic dyes. A large number of offerings have not been suitable to our needs."

"In most instances the American manufacturers have produced satisfactory substitutes for the imported dyestuffs."

"Considering the difficulties encountered in starting a new industry, we think the American dyestuff manufacturers are doing remarkably well."

"The American-made sulphur black we are using has more tinctorial power than any German black we have ever used of the same class."

The query as to idle mills or the running of machinery at less than normal capacity because of scarcity of dyestuffs brought out the fact that very few firms were forced to stop their machinery but that practically all made various readjustmentsi in order to meet the new conditions. A representative manufacturer writes:

"As American manufacturers we are not ready to admit that as a nation we are dependent upon Germany for colors and chemicals, so we have 'kept going' on substitutes and the consuming public has shown a disposition to cooperate."

The effect on business of the dyestuff shortage and the way in which consequent difficulties have been met are shown by the following quotations from several consumers of dyestuffs:

"Fortunately the active demand for goods has enabled us to put out lines that could be made from available materials, thereby holding down to some extent the quantities of high-class colors consumed. Also we have bought, wherever we could, the colors needed, even at speculative prices, in order to keep our trade supplied with goods. The domestic dyestuffs began to appear just in time to save the situation and of course if this had not happened mills on colored goods would have had to close down before now. The greatest trouble at present is the high prices for available colors."

"At the outbreak of the war we bought all available dyestuffs that we could procure. By mixing and blending we were able to use them in our work, and by the purchase of some na-

tural dyestuffs and American-made sulphur colors, we have been enabled so far to keep our mill running."

"Due to shortage of dyestuffs and higher prices it has been necessary to increase the cost of the finished product in some instances."

"We have not been able to produce as good cloth with regards to fastness and variety of color."

Requests for information concerning the operation of the present dyestuff schedule of the tariff (see p. 27), or suggestions as to desirable changes brought replies which are herewith quoted to show the views of some of the large manufacturers of cotton goods.

"We believe that an equitable and just tariff should be established which would not only make this country independent of all foreign sources of supply but also enable the American manufacturers to meet any outside competition. We consider, however, that concerns immediately interested in the manufacture of dyestuffs at the present time are best qualified to furnish facts and other information from which can be determined just what duties should prevail to meet this situation and bring about the desired results."

"The present tariff schedule has not enough protection for natural and synthetic alizarin and dyes obtained from alizarin, anthracene, and carbazol, natural and synthetic indigo, and all indigoids, whether or not obtained from indigo. We believe that it is only a question of a short time before the so-called direct colors are a thing of the past in textile dyeing and printing. The vat dyes, which include the indanthrene, helindones, algols, thio indigo, ciba, and hydron colors, are the type that American dyestuff manufacturers must produce if they hope to keep the color business after the war."

"The best interests of the American worker, producer, and consumer require that raw materials, finished dyestuffs and dyed goods shall be put upon such a parity as to duty as to develop the American production and protect the American manufacturer. The developments of the last three years have

shown clearly the necessity of the upbuilding of a chemical and dyestuff industry in this country that shall prevent any future shortage of those articles and the inevitable inflation of prices attendant upon such shortage."

"We can hardly be expected to approve a tariff schedule which puts a 30 per cent duty on dyestuffs and a duty of 10 to 15 per cent on the fabrics in which they are used."

"We believe that the American manufacturers of synthetic indigo and other fast dyes are entitled to an adequate protection, but what the rates of duty should be we do not feel qualified to advise."

"Answer to the tariff question should more properly come from the manufacturers of the dyes rather than from the consumers, as it involves a detailed knowledge of all the chemical and component parts of dyes and processes of manufacture. From the mill point of view, it is, however, to be hoped that the dye industry will receive such protection as will enable it to withstand successfully all foreign competition."

"As far as we are able to judge, the present schedules seem to be fair and reasonable. We do not pretend to know enough about the details of the tariff to express an intelligent opinion, but our idea is that the tariff should be just high enough reasonably to protect our domestic manufacturers against too close competition from abroad (Germany and Switzerland), but not high enough to enable them to charge exorbitant prices. The domestic manufacturer who has invested a large amount and worked hard to meet the exigencies of the war situation should certainly be protected for some years to come against any unfair competition from Germany and Switzerland, but when the tariff is sufficient to accomplish this we ought not to go any higher."

A Wool Dyer's Viewpoint Regarding Vat Dyes

IF the vat dyes for wool are so superior to other series of dyestuffs, why are they not more generally adopted? Putting the question thus suggests one of two things. Either the dyes are not up to their reputation, or there is something lacking in the dyers. As to the former, they have been so little tried that one can hardly give a definite pronouncement. As to the latter, it is asserted that English dyers are lagging behind those of the United States, Germany, and other countries in their appreciation of these colors." This is an opinion voiced by *The Dyer and Calico Printer* of London.

"But who can tell if this assertion is correct or not? It is a very common, commercial-traveller sort of dodge to suggest that competitors are getting in ahead. For anything the present writer knows, the dyers of U.S.A. and other countries may be having legends served out to them concerning the keenness of English dyers in regard to vat dyes. If such tales are being told they are, in respect to this present writer's acquaintance, terminological inexactitudes.

Some Reasons

There have been many reasons why dyers have not hitherto been keen on these dyes, some of these reasons hav-

ing reference to the dyes themselves, others to the general conditions of the trade, and others accounted for by the personal equation. A short, and probably incomplete, *résumé* of these reasons may be both interesting and useful. As we hope to show, it will need a combination of effort between the makers, the dyers, the designers, manufacturers, and merchants to get these dyes successfully into use. A frank statement of the difficulties in the way will clear the ground for a more fruitful effort.

In the first place, the makers have hitherto discouraged the adoption of these dyes at the very outset by putting too high a price on them. Really, the pre-war price was ridiculous. Only in a few specialties is there any justification for spending so much on the dyeing. The makers perhaps had an idea that the dyer would think how superlatively superior the dyes must be if they could command such fancy prices. If this view is correct, then it is the 'cute ones who lag behind. The English dyers have evidently been of opinion, even before the war, that in the matter of vat dyes the foreigners were putting too high a price on their cleverness. And, after all, though the good qualities of the dyes may be conceded, they are not, like Eclipse, first, and the rest nowhere.

The price, then, must be made reasonable before English dyers will attempt to use them. We do not know what they actually can be put on the market at, but it will pay to give them every chance by fixing them as low as possible.

Difficulty of the Process

It is the more necessary to make the first step as easy as possible, because the second is a very hard one. The awkwardness of the vat process is very much against it. Who would turn from the simplicity of the acid dyebath to the cumbrous intricacy of the vat unless there be some other tremendous advantage to counter-balance it? Even chrome dyestuffs, though more intricate in their application than those of the acid series, are yet a good deal easier to apply than indigo and its relatives.

Getting up the vats themselves is

skilled work that would require close oversight. Manipulation of the goods in the actual dyeing would have to be very carefully watched to prevent air-oxidation, and matching to shade would be a worse difficulty than at present, and it is surely bad enough now. In those branches of the trade where matching is a fetish the vat dyes are practically barred. This applies to warp dyeing, carpet and upholstery yarn dyeing, and much of the dress goods trade. It is a common thing for a holeful of yarn to be held up in the dyehouse whilst a hank is dried, wound, and woven in the loom in order for the color-matcher to give his report. If not satisfactory, another dip has to be given. An acid dyebath can stand quite a long time and only want heating up again to be ready; but a vat is a ticklish thing to keep in condition.

Suppose, however, the risk is taken, but that more color is required to be salted in. Has the calculated amount of dye to be taken and reduced as wanted? If so, what a difficulty presents itself! Fancy overlooking only a dozen pans and having to perform a chemical operation before every salting in.

The alternative is to keep a stock of reduced color. One can imagine several drawbacks to this. However, they need not be detailed, and of course details would vary in different dyehouses. Also, an ounce of practice would be worth a pound of theory. Until someone takes the risks and tries it—and reports—then we may neglect imaginative speculation as unprofitable.

INQUIRY DEPARTMENT

In the establishment of this department it is our desire to help the consumer in buying his products direct from the manufacturer or reliable dealer. Accordingly all questions relative to source of supply will be answered to the best of our ability in an impartial way.

Furthermore, we propose to help in any difficulties that consumers may be having with dyes and chemical products providing that questions do not involve simply tests, which can be readily obtained from those who specialize in such work.

AMERICAN DYESTUFF REPORTER:

How can I distinguish between alkali blue, soluble blue and soluble Prussian blue by a simple test?

Dissolve the sample in hot water and add an excess of sulphuric acid. After a few minutes drop on filter paper. Alkali blue leaves a spot of precipitated color with a ring of clear liquid around it. Soluble and Prussian blues retain their colors in soluble form and only make a colored spot. To another solution of the dye add a little caustic soda and note the change after a few minutes. Alkali and soluble blues lose practically all their color and leave a faintly tinted solution. Soluble Prussian blue is decolorized, but has flocks of brownish precipitated hydroxide of iron throughout the liquid.

AMERICAN DYESTUFF REPORTER:

In dyeing hematine on chrome mordanted wool I have lately only been getting reddish dull shades. What is the probable cause of the trouble?

The dull reddish tone on a logwood dyeing is characteristic of over-oxidation. The extract may have been over-oxidized during manufacture, in which case it would show the defect when dyed on a green chrome mordant. If the extract or crystals are all right, it may be that your mordant has too much oxidizing power. If this is the case, the dyebath will appear like ink and not exhaust. The remedy is to use more chrome assistant and boil longer, so as to reduce the chromic acid and provide more mordanting and less oxidizing qualities.

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"Circulated Everywhere Dyestuffs are Used"

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Harmony Should Prevail in Dyestuff Convention

IT would seem that there has been a considerable diversion of opinion in the counsels of those who are sponsoring the proposed dyestuff Association of America. The original purpose of this Association, as we understand it, was to achieve a closer unity between all factors in the dyestuff industry, whether manufacturers, dealers or consumers. It would now appear, however, that a number of those who attended the original meeting have come to the conclusion that their interests can best be served by limiting the members of the Association to those who are exclusively manufacturers.

In order that those who attend the meeting on March 6th may be informed of exactly what has transpired since that meeting, it may perhaps be as well to review the facts herewith:

At a meeting of the Organization Committee held February 20th, the resolution included in the following letter, which was sent out by the secretary of the committee to all those who participated in the original meeting, was adopted:

IMPORTANT NOTICE

At a meeting of the Organization Committee of the proposed Dyestuffs Association, held at the Chemists' Club, New York, February 20th, 1918, the matter of membership was discussed at length. The opinion expressed by Dr. Matthews, Mr. Poucher, Mr. Merz, Mr. Woodrow, and Mr. Hemingway, speaking through Mr. Kaye, was that the industry could best be served by having an association consisting solely of manufacturers, and that it might be advisable for the dealers to form an association of their own.

After a lengthy discussion Mr. Kaye was requested to prepare a resolution to that effect, to be submitted by the Organization Committee to the adjourned meeting, which would be held in Runford Hall, Chemists' Club, 50 East 41st St., on March 6th, 10 a.m. He thereupon prepared and read to the meeting the following resolution:

"Inasmuch as the interests of the American dyestuff industry will be better served by having one association consisting of manufacturers only, and a separate association for dealers, now therefore be it

"RESOLVED, that the Organization Committee recommend to the meeting of March 6th, that there be formed an association of manufacturers of intermediates and dyes under the name of 'DYESTUFF MANUFACTURERS ASSOCIATION OF AMERICA' or some similar name; and that there be formed a separate association consisting of dealers in dyestuffs and bearing an appropriate name."

The resolution was submitted to the meeting and was adopted by an affirmative vote of all present with the excep-

tion of Mr. McKerrow, who did not vote.

C. Cyril Bennett, Secretary,
pro. tem.

This letter occasioned a certain amount of surprise in the trade as it was generally understood that both dealers and consumers would be eligible to membership in the Association, although their rights as to voting, etc., might be somewhat restricted.

In order that the dealers and smaller manufacturers might be fully conversant with all the circumstances in the case and have an opportunity to crystallize their opinions in advance of the organization meeting, H. G. McKerrow consulted with several prominent dealers and later sent out the following letter calling for an informal meeting, to be held on the evening of Tuesday, March 5th:

February 28, 1918.

Gentlemen:—

You have doubtless received from the secretary of the Dyestuff Convention a copy of a resolution passed at the last meeting of the committee on organization, on which I refused to vote.

You will appreciate that the spirit of this resolution constitutes a complete repudiation of the original intention and vote of the convention. It is clear that it is the intention of a few of the larger manufacturers to attempt to dominate the industry.

Unless the small manufacturers and dealers are fully represented at the meeting on March 6th, prepared to act in defense of their interests as well as the interests of the industry as a whole, their future existence will be jeopardized.

Your presence, as well as that of any others interested in this movement whom you can reach, is, therefore, urgently requested at the organization meeting of the Dyestuff Association to be held at 10 a. m. on Wednesday, March 6th, at the Chemists' Club, 50 East 41st Street.

There will also be an informal meeting of those interested in opposing this proposed resolution, at the same place, at eight o'clock in the evening of Tuesday, March 5th. Your presence at this meeting is also invited.

Very truly yours,
H. Gardner McKerrow.

It is extremely difficult for the Reporter to know what policy to advocate editorially in regard to these matters. We feel, of course, that prominent manufacturers who have been long established in business and who have complete sales organizations are, to a certain extent, independent of the rest of the industry. We cannot but feel, however, that the best interests of all elements will be served to greatest advantage by the adoption of a policy which will provide for complete harmony of interest among all parties concerned.

There are certain large purposes—for the accomplishment of which we believe it would be the intention of the Association to labor—which can only be

achieved through the united support of all elements. Take, for instance, the question of tariff protection—It is the desire of all American manufacturers of dyestuffs to see a tariff created which will at least place the American industry on a basis where it can compete on equal terms with foreign products after the war. On the other hand, it is the wish of those dealers who have dealt chiefly in imported dyestuffs that the tariff shall remain at a figure which will afford them an opportunity to make prices lower than those which it will be possible for American manufacturers to quote.

Besides these two classes, there are a very large number of dealers, who have well-developed associations with consumers, who are willing to handle either American or imported colors, so long as they can give satisfactory service to their clients. A vast majority of these dealers, we believe, would prefer, because of patriotism as well as other reasons, to handle American-made goods. It will readily be seen, therefore, that dealers of this class can be of very material assistance to the manufacturers in securing a higher tariff, if their support is enlisted. If, however, American manufacturers take the position that they wish to discourage the dealer in every way possible and refuse to allow him to handle any of their products, the dealer in sheer self-preservation will be compelled to obtain goods from foreign sources, or at least to endeavor to so obtain them.

It is presumable that one of the early activities of an association representing the manufacturers would be to endeavor to secure legislation increasing the tariff on dyestuffs. If this association had the complete support of all elements in the industry, it is extremely likely that a great deal could be accomplished, even with a Democratic administration, but if, on the other hand, manufacturers were to make representations to Congress, seeking an advanced tariff, and should be opposed by a committee of dealers advocating a low tariff, it is questionable whether a Democratic Congress could be induced to advance the schedules on intermediates and dyestuffs.

A canvass of 1,000 leading consumers of dyestuffs, which the REPORTER conducted in the Fall of 1917, revealed the fact that a tremendous majority of them were disposed to favor a tariff which would be protective of American-made dyes, even though this meant that they would be compelled to pay higher prices for their goods. It is also our belief, based on conversation with a very large number of dealers, that these latter as a class would welcome such legislation if it were made possible for them to obtain a supply of goods from the American manufacturers.

It would seem, therefore, that the opportunity for harmonious action by all elements in the trade—manufacturers, dealers and consumers—looking towards an increased tariff was exceptionally good. In our opinion the possibility of such unified action will be greatly jeopardized if the manufacturers take any action which will be offensive to dealers as a class—such an action, for instance, as the formation of an association which distinctly excludes

from its councils all who are not actual manufacturers.

The tariff question is only one of a number of similar points which, in our estimation, can be handled with much greater benefit to the trade as a whole if complete harmony can be achieved among all interests.

We, therefore, earnestly urge all who attend the Dyestuff Convention on March 6th to sacrifice something of what he believes to be his individual benefits in the cause of greater good for the entire industry. If a spirit of class jealousy is harbored and if individual grudges are aired, it is quite possible that the meeting will entirely fail of its chief original purpose, which was understood by all to be the achievement of unity of thought and action in the dyestuff field, which has up to the present time been conspicuously lacking in this country. If, however, all parties attend the meeting determined that they will forget their petty jealousies and sacrifice their interests as individuals, to a reasonable extent, it is not only possible but extremely probable that a basis of organization can be developed which will result in tremendous good for all elements in the industry.

Olney Chemical Alumni Meets

The eighth annual mid-winter reunion of the Olney Chemical Alumni of the Lowell Textile School evening course was held at the Richardson Hotel, Lawrence, Mass., Saturday afternoon and evening February 16, 1918. The following members were elected officers:

Mr. Samuel J. Nichol, president.
Mr. James H. Spurr, vice-president.
Mr. A. T. Herron, secretary and treasurer.

Board of Control

Mr. Harry Buckley.
Mr. Samuel Stott.
Mr. James Meyers.
Mr. Geo. Stewart.

After the business meeting adjourned a banquet was served during which the Arion Male Quartette of Lawrence rendered appropriate selections. After the banquet there were some very interesting speeches delivered by Mr. C. H. Eames, Prof. L. A. Olney, Dr. H. D. Smith and Mr. R. R. Sleeper of the Lowell Textile School and Agent Wm. A. Pedler of the Acadia Mills, Lawrence, Mass.

Annatto Dyes

Consul Henry D. Baker, Trinidad, British West Indies

THE *Agricultural News,* published by the Imperial Department of Agriculture for the West Indies, states that some years ago the Commissioner of Agriculture gave attention to the question of preparing coloring matter from annatto seeds and discovered a simple process for the purpose. He found that the coloring matter is easily removed from annatto seeds by washing them in a dilute solution of ammonium hydrate. The solution is strained off from the seeds and evaporated to a thick paste in steam-heated pans, when it yields an annatto paste of greater brilliancy than that obtained in the usual way. The great simplicity of this

process would permit of its being carried out in places where annatto is grown, so that the concentrated paste might be shipped instead of the somewhat bulky seeds.

Because of the shortage of dyestuffs, the commissioner recently brought this matter to the notice of the Colonial Office, suggesting that it might be well to submit the idea to the Inventions Board as of possible use at the present moment. The Department of Scientific and Industrial Research was consulted, and it has reported that annatto is now chiefly used for coloring butter and cheese and only to a very small and unimportant extent in dyeing.

Annatto is not grown to any extent in the West Indies, except perhaps in Jamaica, which still produces a small quantity. Should there be any future for this dye, and the cultivation of the plant extended, it would be an easy matter to carry out the progress suggested, as a factory for the purpose would be a simple affair. After the dye is extracted seeds might possibly be used for oil production and as cattle food.

Logwood Extract and Hematine

FOR some reason there has been a considerable activity in logwood products in the past week, as well as many controversies regarding quality.

There is no other class of dyestuff so likely to be misunderstood by both dealer and consumer and it is well to review some of the characteristics of this dyestuff which may explain a few of the difficulties. The first extraction of the wood yields a liquid which contains but little of the higher oxidized product, known as Hematine. Later this is oxidized more or less by air or chemical means and concentrated to a 51° extract or made into a granular mass which is sold as "crystals."

In dyeing it is only the Hematine which acts as a coloring matter and unites with the mordants. This is true both of the Hematine which exists in the commercial product as well as that which is formed by chemical action during the dyeing operation. A wool dyer can use any degree of oxidation by adjusting his mordant so that all the color-

ing matter is made available. A dyer of chrome-tanned leather only utilizes the Hematine as a rule, while a silk dyer wants a low oxidation in one stage of his dyeing and a high oxidation in another.

As the strength tests of the goods offered are made in various ways it is easy to see how one test will utilize more of the unoxidized part than another and give a false value to the product. There is a need for a uniform method of testing logwood products which will furnish a figure indicating the degree of oxidation as well as the total amount of available coloring matter. Until such a uniform method is adopted we may expect to see varying and conflicting reports, due to the two elements existing in every logwood preparation.

A New Yellow Extract

A new vegetable extract has made its appearance on the market and promises to be a close rival of the commoner yellow dyewoods. In qualities it closely resembles Flavine, dyeing full dull yellow shades on a chrome mordant and giving bright golden tones with tin and oxalic acid. The dyeing properties are not novel by any means, but the high tinctorial power of this solid extract together with its low price in comparison with the older dyes and Alizarine yellow makes it of particular interest at this time.

The first question naturally is whether it is available for Olive Drab. The extract dyed on a chrome mordant and shaded with a little fast chrome blue matches the proper shade. The color is fast to light but reddens in the soap and soda tests the same as the other natural yellows. Efforts are being made to have vegetable yellows permitted by the Government for use on meltons but the matter is still under consideration.

An Alkali Blue

An alkali blue and a soluble blue have recently been placed on the market by the Dicks David Co., the products being manufactured in their plant at Chicago Heights, Ill. As far as we know this is the only company manufacturing these two very much needed dyestuffs in any quantity in this country. A member of the company informs us that shipments are already going forward on large contracts made in advance on the strength of the first sample lots produced.

Apology

Some weeks ago we published in the REPORTER a list of American manufacturers of aniline colors, which was prepared for the U. S. Government and reprinted by us from the *Textile World Journal*. It has been brought to our attention that this list was originally prepared by the *Trade News Service* of New York and that the *Textile World Journal* used it without authority. We wish to extend to the *Trade News Service* our apologies for using their material without due credit.

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MYRON DREW REESER, Managing Editor

Is a Russian Debacle to be the Fate of the Dyestuff Association?

THIS journal does not claim a gift of prophecy, but we cannot help calling attention to the remarks we made a few weeks ago regarding the standing of the dealers in the new dyestuff association. Perhaps we are premature in publishing this bit of information, but we feel that it is better to be premature than too late. The small manufacturers, dealers and consumers of dyestuffs are marked for betrayal, and the association they aided, in its organization and expenses, is to be exploited for the benefit of a few of the larger manufacturing interests.

The organization committee met at the Chemists' Club on February 20th and took up the matter of membership. It must be remembered that this committee is composed principally of representatives of manufacturers. The result was that a resolution was prepared to be read at the convention on March 6th.

"Inasmuch as the interests of the American dyestuff industry will be better served by having one association consisting of manufacturers only, and a separate association for dealers, now, therefore, be it

"Resolved, that the organization committee recommend to the meeting of March 6th, that there be formed an association of manufacturers of intermediates and dyes under the name of 'Dyestuff Manufacturers Association of America' or some similar name; and that there be formed a separate association consisting of dealers in dyestuffs and bearing an appropriate name."

Even at this time there is little hope of saving the original plan of the association. All that the manufacturing interests can see at present is the benefit they will obtain from tariff revision and Government assistance in their difficulties. The dealers really had nothing to gain from a high tariff, quite the reverse, yet they were willing to lend their support to this end and endorse arbitration, standardization or whatever other features would restore the shattered confidence of the consumers. The small manufacturer would do well to understand that his status in an organization composed of several lions and a flock of lambs like himself could hardly result in the lambs attaining a ripe old age.

The consumer and public at large welcomed the original plan and the outlook was most desirable. We do not believe that the general sentiment of the smaller manufacturers is to exclude the dealers entirely. We can understand why a fully organized corporation with its own manufacturing and sales departments should regard a dealer as a hated rival, but the smaller factories are very glad indeed to have selling connections to dispose of their products. If the manufacturers condemn the business methods of an occasional dealer, they should do so very cautiously, because many dealers have on hand proofs of similar cases against manufacturers. The new association had hoped to regulate business transactions and raise the general moral tone of the business above where the Germans left it.

Is it possible that this regulation is more feared by some manufacturers than by the dealers?

Fortunately the entire question cannot be summed up in generalities and there will always be enough difference of opinion to give hope that right will prevail.

The manufacturers should study well each member of the committee and ask themselves. "Is this man working for my interest or for his own, does he understand my relation to the trade or only his own, what right have I to expect any better treatment than the dealers receive?"

(*Continued on page* 12)

The tariff question will assume a different aspect to the commission when it learns that the manufacturers who now want to double the present rates, refuse to sell to dealers while the dealers want English, French and Swiss dyes to carry as little duty as possible. The smaller manufacturers actually need the co-operation of both dealer and consumer, the larger ones feel more sure of themselves and care very little what becomes of their competitors.

Let everyone understand our position and accept our advice for what it is worth. We have no axe to grind and are not trying to please any class of readers at the expense of others. We stand always for clean business and a square deal for everyone, but above all a triumph of the American dye industry over its obstacles, and its permanence in this country.

The principle of "all for one, one for all," must hold if the industry expects to attain its aims and put up a strong resistance to future competition. The old Aesop fable of how the lion was only able to destroy the cattle by inciting discord and causing them to separate is worth remembering at this time.

The dealer is in but little danger and has few favors to ask of anyone, but the smaller manufacturer is in real danger from several points and should not be misled by those who would direct his destiny for their own advantage.

The original plan for the association was good, it has been attacked on several occasions and too much ground has been lost already.

One member of the original committee, and later committee as well, referred to the general assemblage as "The Bolsheviki." This point was allowed to pass unchallenged, but it brings up comparisons, and we wonder into whose hands they will be betrayed, Romanoff or Hohenzollern?

The following letters from manufacturers and dealers commenting on the situation which exists in regard to the Dyestuff Association have been received by the REPORTER. We reproduce them thinking that they may prove interesting to those attending the convention on March 6th.

American Dyestuff Reporter.

Gentlemen:

I have before me a letter signed by Mr. McKerrow containing this sentence, "It is clear that it is the intention of a few of the larger manufacturers to attempt to dominate the industry." Were the larger manufacturers inclined to confine themselves to a domination of the Dyestuff Industry, I would not look upon the future of the small manufacturer with the same degree of pessimism, for I believe that the larger manufacturers will not only dominate the Dyestuff Industry, but will do so to the exclusion of the smaller manufacturers.

I believe this to be due mainly to the fact that there is in this country only one source of supply of aromatics, forcing all of us smaller manufacturers to go to the Barrett Company for our supplies. This puts the whole industry in the hands of a very few men and as these men are closely affiliated with the National Aniline & Chemical Co., it is only natural that the outsiders should lose the help that would come to them from the Benzol and Toluol producers were they not controlled by the Barrett Company.

I am decidedly of the opinion that the American Dyestuff Ass'n should not be controlled by a small group of men, but rather by the aggregate of the smaller manufacturers.

Yours very truly,
The Seydel Mfg. Co.,
Jersey City, N. J.
By H. Seydel, Manager.

American Dyestuff-Reporter.

Dear Sirs:

We have received a letter relative to a resolution to be put forth at the next meeting, as to dealers having a separate association of their own in the Dyestuff Industry. Not being in full possession of the facts as to whether they are to be recognized as an association by the Manufacturers Association, we cannot give any definite decision at this time.

At the meeting held in January, this matter was one of the first under dis-

cussion and it was finally agreed to by a majority of the makers present to have dealers as associate members under certain conditions. Whether it is finally settled that they be associate members or that they have a separate association of their own, affiliated in some way with the manufacturers, it will be necessary to ascertain who are actually legitimate dealers, eligible to membership. The first question is, What is a legitimate dealer in any line of business?

Another matter to be decided is, in what class are the manufacturers who also act as dealers in other goods, besides those which they make, to be placed. Irrespective of size, it will probably be found that a majority of manufacturers (possibly eliminating those who make intermediates) really sell more goods which they buy in the open market as dealers than those which they manufacture.

Another matter is, what position will dealers take after the war when we have the competition of foreign makers?

These are only suggestive questions and, while we have our ideas on same, this is not the time or place to answer them.

We hope the matter will be amicably settled to the best interests of all at the next meeting, as this industry, under existing conditions, will need all the aid possible from every source that is interested, to bring it to a successful basis for the future. Of course, the problems arising in the industry are mainly those for the manufacturers' attention and whatever conclusion the manufacturers as a majority arrive at, will necessarily have to be agreed to by others interested.

We await with great interest, the final decision in this matter.

Yours truly,
Hine Brothers,
New York.
By Harry Hine.

American Dyestuff Reporter.

Gentlemen:

I believe, with the majority of the organization committee of the proposed Dyestuffs Association, that the industry can best be served by an association consisting entirely of manufacturers.

There seems to me to be a marked difference between the relationship of a manufacturer and a dealer toward a manufacturing industry. The former has a responsibility and an interest that of necessity are more stable than those of the dealer. The manufacturer depends for his success upon his ability to produce a commodity of a quality and at a price that will meet competition. If he cannot do this he fails. He cannot compel his customer to pay him a higher price for his goods than is asked for the same thing by the man next door.

It is unsafe and of unsound principle to demand of the customer a higher price based upon patriotism, and no amount of so-called patriotism will induce a man to lose money in business enterprise.

The dealer is a customer of the manufacturer and if the latter hopes as a result of so-called patriotism to maintain his industry by getting from a dealer a higher price than is asked by a

foreign competitor, I believe he will soon awake to his error of judgment.

It is the manufacturer who must assume the responsibility of placing at the disposal of the dealer material at an equal or better price than can be obtained elsewhere and therefore it seems to me to be essential that if the color industry is to endure in this country it can only be by a combination of manufacturing interests devoting their energies to the problems of quality and production, and through this combination of interests so reduce costs that competition on sound business principles will be made possible.

Very truly yours,
Sizing Specialties Company, Inc.,
Jersey City, N. J.
Alfred Spice, President.

American Dyestuff Reporter.
Gentlemen:

The writer has had considerable experience in Association work, and believes that the American Dyestuff Manufacturers' Association is absolutely right in excluding dealers from active membership and cooperating as manufacturers. A great many large consumers prefer working with the manufacturers, and are very skeptical about having much to do with the dealers. There are probably good reasons why a great many dyestuff dealers in this country should be eliminated, as most of them have jumped into the business with the idea of getting rich quick.

A dealer with the right training, and sufficient capital requirements can be of great service to the manufacturers and consumers, and is bound to make a good living, but should not feel hurt because the dyestuff manufacturers see fit to form an association for their own protection.

In discussing this question with manufacturers we have found that the above represents their sentiments, and it is not our own individual opinion in any way, but simply an expression of what we think dyestuff manufacturers and others interested feel to be the proper course.

Very truly yours,
Fisher Chemical Company,
Boston, Mass.
Andrew Fisher, Jr., President.

American Dyestuff Reporter.
Dear Sirs:

In our judgment the best interest of the dye industry in this country will be met by the formation of two distinct organizations, viz.: a dyestuffs manufacturers' association and a dyestuffs dealers' association. Though the time may come when these two associations can be merged with advantage, we feel that the work to be accomplished by both manufacturers and dealers is so extensive that it can best be accomplished by the two groups working independently, though, of course, with the common purpose of developing a domestic dye industry.

Yours very truly,
Reliance Aniline & Chemical Co.,
New York.
F. M. Brinckerhoff, Vice-President.

American Dyestuff Reporter.
Gentlemen:

We are indeed surprised at the stand

taken by the Organization Committee of the Dyestuff Association in excluding dealers from sharing membership in this association.

It seems to us that the main purpose of this association was to influence legislation at Washington, and as one of the gentlemen at the first meeting pointed out, a delegation representing eight or nine hundred members, made up of manufacturers and dealers would have more influence and possible consideration than one representing the bare two or three dozen members it would represent if manufacturers only participated in membership.

Yours very truly,
Delta Chemical Company, Inc.,
J. F. Hollywood, Mgr.

ON another page we have made specific mention of the probable outcome of the Dyestuff Association's meeting on March 6th, and have allowed this feature to perhaps overshadow everything else in this issue. Such a course seems inevitable because we have consistently advocated the Association from the start, not from any personal motives but because we felt that it was a necessary feature in the development and future existence of the dyestuff industry in America. The ideal condition would be to have harmony throughout and a close relation to the consumer so that any outside attacks would meet with a united resistance. If this cannot be, the next best thing would be to have a firm union of the greatest number who are loyal to the cause.

Idealities such as this are often difficult because each individual feels a spirit of self-interest which is bound to dominate his interest in his fellows. The only remedy is to make the individual see that by yielding a bit and accommodating his view to the point of view of the body he will be more benefitted than if he attempted to work alone.

Large corporations of to-day have not the same feelings as individuals. They are self-contained and seldom require the assistance of others. Even the men who form a part of them are but items in the general make-up and may be moved about by the will of the directing force. Therefore the point of view of any large interest differs essentially from the point of view of any smaller interest, which is often dependent on outside factors for its very existence. To reconcile these two classes and make a common cause is little short of a miracle, and having once reconciled them the union has as little stability as a basket full of cannon balls and eggs.

While we hope for harmony and are trying to make it a fact, we realize the difficulties. If we see the new associa-

tion fall apart in places on account of its lack of uniformity it will occasion no surprise. The first efforts should be to gather the cannon balls together and let them roll and clash at will but also get the more fragile eggs into a place of safety so they may be preserved for future development.

The matter is not in our hands, it rests with the small manufacturers. Unless they realize how much like egg-shells is their resisting power, we fear for the consequences.

American Names for Dyes

Why Dropping of German Ones for Colors Is Advisable

That American-made colors should be given names of their own, and that they should no longer be called by titles arbitrarily coined by German producers in the days before the war, is the contention set forth in a pamphlet on colors that has been sent out by John Campbell & Co., 75 Hudson Street, of which George T. Whaley is President. In conclusion the pamphlet says:

"Every American manufacturer of dyestuffs should give to his colors an appropriate name. We should get away from the habit of referring to American colors by foreign names. In a comparatively short time we have produced colors that are equal to, and in many instances better than, the so-called German standards. It is only a question of time when the fastest, rarest, and most intricate dyes will be produced in this country.

"Now, the American consumer will never willingly put himself in the position he occupied when the war shut off the supply of German colors. He realizes the necessity of having a dependable source of supply at home, and the only way this can be done is for the consumer of dyes to support the American dyestuffs manufacturer. No American mill man should use the German trade words for the names by which he has known colors in the past. To do so would be playing right into the hands of the German business propagandist. Therefore, let us be loyal to everything American, and among other things designate the American colors by their American names."—*Times.*

Rhodamine B

Although promises of this product from American sources have been persistent for several months, none has appeared so far.

We are assured, however, that in a week or two, at the most, there will be a supply available.

This product will be welcomed by all classes of dyers as they hope that American production will break the high price this dye now commands.

If past experience is to guide us we may expect little change in the price for a time. It seems to take some competition to lower prices and improve quality, and unless a large supply is produced the first to bring out American Rhodamine will have an opportunity to get a good price for it.

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

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Report of the Meeting of Dyestuff Manufacturers

THE second meeting of the dyestuff manufacturers and dealers was held at the Chemists' Club, New York, on Wednesday, March sixth. This meeting was a sequel to the first conference which was held on January 22nd and 23rd. At the meeting held on January 22nd a committee on organization was appointed with instructions to prepare a report and to submit same at the meeting on March sixth. There was some dissatisfaction at the meeting on January 22nd—the manufacturers feeling that the dealers had no right to membership in the Association, if permanently formed. The manufacturers seemed to feel that only actual producers should be allowed to become members, while the dealers seemed to feel that the organization should be extended to embrace them. After much discussion pro and con on this subject, it was finally settled that the association be formed composed of two classes; first, actual manufacturers who would be designated by Class A, and dealers and distributors who would be known as belonging to Class B. A number of the larger manufacturers were not in sympathy with this arrangement and meetings were called, attended only by actual manufacturers. A special method of procedure was drawn up by these actual manufacturers and submitted to those present at the conference on March sixth; at this meeting Dr. J. Merritt Matthews presented the report of the temporary committee on organization and stated that the committee had obtained the views of certain representative manufacturers and had found them in favor of forming an organization that would be composed solely of manufacturers. He read the following resolution, which has been approved by the committee:

"Inasmuch as the interests of the American dyestuff industry will be better served by having one association consisting of manufacturers only, and a separate association for dealers, now and therefore be it

"Resolved, that the Organization Committee recommends to the meeting of March 6th, that there be formed an association of manufacturers of intermediates and dyes under the name of DYESTUFF MANUFACTURES ASSOCIATION OF AMERICA or some similar name; and that there be formed a separate association consisting of dealers in dyestuffs and bearing an appropriate name.

Mr. H. Gardener McKerrow then submitted *his* suggestion for the proper conduct of such an association as proposed.

Mr. McKerrow's suggestions indicated careful preparation and a thorough knowledge of the subject. This

paper was preserved by the committee for future reference.

In the absence of Mr. Frank Hemingway the meeting was presided over by Mr. B. M. Kaye. After the report of the organization committee had been presented a general discussion from those present was called for on the question of membership. After a numof speakers had voiced their sentiment it was seen that the dealers were in the minority and Mr. M. R. Poucher moved that an association be formed along the lines set forth in the report of the organization committee. Mr. McKerrow offered an amendment to the effect that the suggestions as set forth in the minority report be adopted. This motion was lost and the suggestions of Mr. Poucher were voted upon and carried. Chairman Kaye then stated that steps of organization were in order and it was voted to elect a board of governors who would be empowered to take the steps necessary in perfecting the organization. The committee as now formed was voted to hold office for a period of one year. The following were then elected as members of the board of governors: George H. Whaley, of John Campbell & Co.; M. R. Poucher of E. I. du Pont de Nemours Co.; Albert Blum of the United Piece Dye Works; K. C. of Jeffcott of the Calco Chemical Co.; August Merz of the Heller & Merz Company; R. P. Dicks of Dicks David Co.; M. S. Orth of Marden, Orth & Hastings Corporation; Frank Hemingway of Frank Hemingway & Co.; L. A. Ault of Ault & Wiborg Company; J. M. Mathews of the Grasselli Chemical Company; Robert A. Kemp of Holliday-Kemp Company, Inc.; E. H. Kilheffer of the Newport Chemical Works; Dr. Samuel Iserman of the Chemical Company of America; Dr. I. V. S. Stanislaus of the Stanley Aniline & Chemical Works; and W. H. Cottingham of Sherwood & Williams.

It was decided that the next meeting be called by a vote of the Board of Governors but it is safe to say that they expect to convene within a short while. Before the adjournment of the meeting it was suggested that a vote of thanks be tendered to Mr. McKerrow for his efforts in helping to bring about closer cooperation of those engaged in the industry. There is some question as to the attitude of some of the larger companies with regard to smaller manufacturers and the REPORTER hopes to be able to publish at a later date an expression from some of the larger companies on this subject.

Fastness of Dyestuffs to Light

IT has always been considered desirable to be able to express the fastness to light of any particular dyestuff by means of a definite figure which would be understood and accepted by the trade at large. It can be readily appreciated that any particular dye varies in fastness according to the depth of its shade and thus causes some confusion when comparisons are made between two dyes that are somewhat different in tone but quite close in their power of resistance to fading. Therefore, we cannot give our hearty en-

dorsement to the following scheme, but submit it as an example of the efforts that have been made in this direction.

The following standards of fastness are by P. Heermann and are the basis of the second report to the Verein deutsch. Chemiker. (The numbers following the dyes refer to the numbers in the Schultz & Julius tables).

Certain standards prescribed in the first report have been modified and replaced by the following:

Fastness to Light

(1a.) Fastness of dyed cotton. The sample is exposed together with the dyed standard in a box suspended in the open under glass, one half of the object being covered by paper or cardboard. At the Materialprufungsamt two exposures are always made, one under glass and one in the open, subject to all atmospheric influences. Dressed goods are faster to light than undressed goods.

The type standards are: I. 5% of Chicago Blue 6 B (424) dyed at the boil with two additions of Glauber's Salt.

II. 0.8% of Methylene Blue B.G. (659) dyed cold to warm with 2% of acetic acid on a 3% tannin and 1.5% antimony salt mordant.

III. 1% of Indoin Blue on cotton mordanted as in II.

IV. 20% of Kyrogen Violet with 1.5% times its weight of crystallized sodium sulphide, dyed at the boil with the addition of soda-ash and salt.

V. 2.5% of Benzo Light Red 8 B. L. dyed as in I.

VI. 10% of Hydron Blue G., 20% paste (748) dyed at 60° C. with caustic soda and 5% of hydrosulphite.

VII. 8% of Sulphur Black T., extra (720) dyed as in IV.

VIII. 25% of Indanthrene Blue G. C. paste dyed with 6.25% of hydrosulphite and caustic soda.

Fastness of Dyed Wool

(1b.) The tests are carried out in the same way as for cotton; in the case of piece goods the exposure should be made both under glass and in the open. The type standards are:

I. 3% of Indigotin 1a, powder (877) dyed at the boil with 10% of Glauber's salt and tartar.

II. 1.5% of Ponceau R.R. (82) dyed in the same way.

III. 2.75% of Amaranth (168).

IV. 4.5% of Azo Acid Red B. (64).

V. 5% of Acid Violet 4 R.N. (B. A.S.F.) with Glauber's Salt and acetic acid, from 40° C. to the boil, finished at the boil with Sulphuric Acid.

VI. 2.5% of Diamine Fast Red F. (343) after-chromed.

VII. 4% of Anthraquinone Green G.X.N. (864) dyed as in V.

VIII. Indigo (874) dyed to a shade equivalent to 2.4% of Sulphocyanin G.R. extra (257): or 7% of Naphthol Green B., (4) dyed with 10% of Glauber's Salt and tartar, beginning at 50° C. and finishing at the boil for one hour.

The defects of such a system are obvious to all. No account has been taken as to whether the exposure is made under absolutely dry conditions or whether the air is charged with moisture, which factors exert a great influence on the fading of any given dyestuff. We believe that the subject of

fading will eventually be worked out on a basis of the number of hours of exposure to Ultra Violet Rays which any dye will stand. There will be of course a variation in the resistance of different percentages and it will always be difficult for anyone to say at just what point the fading has begun. Fading undoubtedly commences as soon as the sample is dyed but we take no note of it until we are able to perceive it with our eyes. As different observers will make different observations the personal factor will be a considerable one.

INQUIRY DEPARTMENT

AMERICAN DYESTUFF REPORTER:
What use has Lithol Red and similar pigments in the textile industry?

The only outlet for such products is through the calico printers who use Albumen colors. The insoluble color is mixed with Egg Albumen and printed, then steamed and the color is fixed securely on the fibre. There is no way to utilize such colors as dyestuffs, in the ordinary sense of the word.

AMERICAN DYESTUFF REPORTER:
What is the constitution of Wool Blue S, that was on the market before the war? I do not see it mentioned in any of the books and yet it was a popular dyestuff.

Every lot of the Wool Blue S we ever met was a mixture of Acid Green and Acid Violet 6B. There were many of this sort, differing in their ingredients, but the best was made from Fast Green Extra Bluish (Bayer) and Acid Violet 6BN (Badische). The use of Acid Violet 4B or Formyl Violet S4B is not to be commended, as all mixtures containing these products turn very red in artificial light.

There was a Wool Blue B (Sandoz) and Wool Blue N Extra (Bayer), double strength products which were not mixtures, and corresponded in shade to the regular Wool Blue S.

AMERICAN DYESTUFF REPORTER:
I have an opportunity to buy some domestic Fuchsine and Malachite Green which are not quite up to the standard in solubility. Is there any way I can utilize them without danger to my stock?.

The procedure in both cases is the same. Dissolve the dye in boiling water with the addition of some Acetic Acid and Alum and boil for 5 minutes. Filter the solution through several thicknesses of cheesecloth and all insoluble specks will be retained. After such treatment it is hardly likely that anything more will separate and the dye solution may be used in the regular manner.

AMERICAN DYESTUFF REPORTER:
Why cannot Acid Blacks be used in light shades and in combinations without causing speckled dyeings?

The principal reason is that few of them are level dyeing. When used in full shades the excess of dyestuff saturates every fibre and this defect is lessened. In light shades or in small quantities the affinity for the fibre is so great that they will not go on evenly and consequently show speckled effects. This might be overcome by the use of an extra amount of Glauber Salt and only a little Acetic Acid instead of Sulphuric Acid. The best way to

darken any mixture or combination shade is by the use of a color opposite to the predominating shade. Such a method is really cheaper and much safer than using blacks for shading.

Soluble Blue

BEFORE the war this dye had a rather limited use because there were so many other products that covered the same ground. The redder shades were used extensively by laundries, bleachers and paper makers for blueing whites in such cases as permitted the use of a little acid to keep the color bright. Soluble Blue being closely related to Alkali Blue, requires to be in an acid condition, otherwise it becomes decolorized. This property is utilized by silk throusters and manufacturers of white goods for tinting purposes. Silk or wool may be tinted blue with Soluble Blue and pink with Acid Magenta and the weaver may observe the progress of his work without difficulty. After the piece is woven a simple scouring will remove all the color and only a white fabric remains. Under the name of Paper Blue large quantities of the bluer shades were used for both pulp and calendar coloring, it being preferred to basic blues in all cases. Cheap carpet yarns were dyed with Soluble Blue and it was also a favorite color with the Chinese dyers, much of our supply for the period since the war having come from China in the small tins in which it was originally sold.

Many years ago a successful dyer of men's woolen goods, in the piece, used to make his navy blues by first mordanting the pieces with Bichromate of Potash (or Soda) and Tartar, and dyeing with a combination of Logwood Extract and Soluble Blue. Finally there was added about ½% of extra chrome which resulted in a full and fairly fast Navy Blue that was only excelled by the true Aligarines at that time. The Sulphon blues gradually encroached on this method but never gave level shades as easily. At the present time, when the faster blues are needed for navy work, there are many woolen mills that could go back to this old process for

their lower grades. Soluble blue is now being made in America and it is likely that the supply will soon be ample. We should not confuse Soluble Blue with Soluble Prussian Blue—a chemical color, easily affected by alkalies, but having no dyeing qualities.

Dyestuff Market

Conditions in the dyestuff industry have not been particularly brisk lately. There seems to be a scarcity of spot stocks and this, perhaps, is an important factor in restricting active trading. The freight congestion is also a serious handicap and until this is adjusted we fear business will be of very small volume. The market is strengthened slightly by the scarce supply of raw materials and also the taking over of certain products by the Government has tended to strengthen the market. There seems to be a fair increase in the volume of business now being done in coal tar products. The REPORTER has received numerous inquiries and in answering these we have found some difficulty as there seems to be a limited supply on hand. A number of manufacturers are looking forward with some apprehension regarding the toluol supply and some have expressed themselves as being of the opinion that this scarcity will continue for the duration of the war. One very serious handicap in the delivery of products has been the shipping congestion and we have noted that a number of companies are making deliveries by express, this of course, applying to very small amounts.

We are assured by a large dyewood company that dyewoods and dye bases are moving very slowly on account of the non-arrival of stocks. It is noted that dyers of khaki cloth are eagerly seeking quercitron and prices on this product are holding firm. There is a marked scarcity of heavy chemicals and other chemicals are obtained only in small supplies. Some little activity has been noted in the last few days in heavy chemicals but the situation has not been relieved as the products are immediately absorbed and at high levels.

Indigo Blue Secret

Du Ponts Claim to have Solved German Formula for Indigo Blue

The Government has been advised that the du Ponts have successfully made the first run of indigo blue and produced an article quite up to the German or Swiss standards. This result has been attained by long and painstaking experimentation, starting from the German patented formulæ, which, as an incident of the war status, citizens of the United States may utilize. Owing to the peculiar manner in which the German patents were taken out and the incomplete statement of the formulæ themselves, it has been a tedious process to get the desired results, but this has been accomplished, it is understood, with entire success.

The achievement has come none too soon, as the entire supply of indigo dyes is limited all over the world. This dye is now worth $17,000 a ton.—*Times*.

What Are Your Difficulties?

Some consumers of dyestuffs are experiencing difficulty in obtaining certain colors, if we are to judge by the number of inquiries that have been received this week by the REPORTER. Some time ago, we announced that we would be only too willing to cooperate with the small consumers in helping them to obtain certain colors that they might be in the market for. It will be readily seen that we are in a position to help to a great extent, as we naturally are well-informed as to colors available and new colors that are being offered. We hope that consumers of dyestuffs will not hesitate to make use of this service, which also applies to testing of products and any other information that may tend to better conditions in the industry.—*Editor*

The American Yarn Dyeing & Bleaching Company of Passaic, N. J., has been incorporated with a capital stock of $25,000. The incorporators are, Vera Glass, Louis Wallisch and Alfred Arfstrom.

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MYRON DREW REESER, Managing Editor

To Legitimate Dealers in Dyestuffs

While there is a possibility that some provision may be made in the dyestuff Association for the reputable dealers, it may be that there is a sentiment, on their part, that they should have their own association. We feel that an opportunity should be given for them to make some statement and put their views on record. Every dealer in dyestuffs, natural and artificial, is therefore invited to write to this paper a brief letter stating his views. In the event of there being a sufficient interest manifested, to warrant it, we will arrange to bring these now scattered interests together so that the wishes of the majority may be carried out. The recently-organized association does not cover the entire ground but leaves a large field for the dealer, who also has a need for an association.

This is not a time for personal feelings. The thought should be of what may be accomplished for the general good of your business and your relation to manufacturer and customer. The small manufacturer, who is also a dealer, has the same relation to the customer as the plain dealer and while the manufacturer's problems are being worked out by the association just formed, the other problems should not be neglected. If there is a common in terest the letters will indicate it, but if the interests are divergent it will be advantageous to rectify them.

While the meeting of the dyestuff association did not result as we had hoped there is no real cause for regret. We have given the movement the fullest publicity since its inception and devoted our time and efforts in the direction of a harmonious association. Even the night before the meeting it seemed that the new plan, which gave each class of members an independent organization, would solve the problem. That this plan was not accepted is partly due to the failure of a number of dealers and small manufacturers to attend the meeting and support the movement, led by Mr. McKerrow, in accord with their expressed intentions. This failure left the burden on its sponsor while those who had been very enthusiastic beforehand either remained absent or reversed their votes.

If the association now represents a body that includes all that is good in the industry then much has been accomplished. We had hopes that the dealers really were interested in a movement for the common good but now must confess our doubts.

Since the meeting several rumors have been persistent—one being that arrangements will be made to take high-class dealers and others interested in the industry into associate membership. This would mean that there would be a reversion to the original plan, but with the distinction that the associates would be carefully chosen before admission, rather than having the undesirables sifted out after taking in a large body of mixed membership.

We hope this rumor is true for it will greatly enlarge the scope and usefulness of the association. The class from whom we will not accept advertisements have no place in the association, but the legitimate dealer has a standing that cannot and must not be ignored.

In the pressure of the business of organization it is not to be expected that many plans for the future can be worked out. These will take time and gradually be worked out as opportunity permits. It is something to have an organization, and if past experiences are to be judged there is a prospect of an excess rather than a dearth of reform movements.

Everyone will be interested in the gradual development of arbitration and standardization. The first can be accomplished quickly but the later means much work and the probable co-operation of outside laboratories.

Publicity and propaganda also call for the help of all who are interested in this vital American industry. No official sanction or authority is needed, just talk American dyes whenever you have the opportunity.

Notes of the Trade

It is reported that the Hollywood Dye Works, dyers of woolen and cotton fabrics, located at 2024 East Willard Street, Philadelphia, Pa., have leased a large building at D Street near Ontario, to which they are now removing their plant equipment. It is hoped that this change will greatly increase their facilities and production.

A company has been incorporated in Dover, Delaware, known as the Cellocilk Company with a capital of $1,000,000 and will engage in the manufacture of imitation silk. The incorporators are Geo. B. Martin, of Philadelphia; J. Vernon Pimm, and S. C. Seymour of Camden, N. J.

Joseph B. Miller, dealer in dyestuffs and chemicals, with main office in Philadelphia, has opened a suite of offices in New York City located at No. 1 Wall Street.

New Color Cards

The Products Trading Company, 396 Broadway, New York; Fred Wetzel & Company, 21 Park Row, and R. Lechner, 200 Fifth Avenue, have recently produced new color cards showing shades of American-made dyes handled by their respective firms.

Some Practical Points of Chrome Blacks

Chrome Blacks for wool, of the Diamond Black type, have always been a source of more or less trouble to the dyer because he assumes that they are to be worked like other after-chrome dyes. It would be better if the dyer would consider them as working like direct cotton dyes on wool, during the

first part of the dyeing, and depending on the boiling, with only a little acetic acid, to put the color on the fibre evenly.

When the bath is nearly exhausted, a further addition of acid is advisable to completely exhaust the bath. Sulphuric Acid is to be avoided throughout as it produces a redder shade.

The dyestuff itself is particularly likely to foam, more so if dyed in a top dyeing machine, or other circulating pressure type of apparatus. There is also generally a deposit of dark gummy matter around the top level of the liquors.

Both these features are due to certain impurities which accompany the intermediates from which the dye is made. Before the war some types were developed that were free from both defects, but at present we still encounter them.

It is essential that the dyeing be conduced so the coloring matter has a full opportunity to penetrate the fibre before being fixed, otherwise a mere superficial dyeing will result and the fastness suffer in consequence.

In whatever way the acid dyeing comes in contact with the chrome bath the dye will be fixed, and if each fibre is coated with loosely fixed dye there will be a difference from a proper dyeing where the dye penetrates the fibres uniformly.

Chroming not only changes the shade from a reddish tone to a full black but produces an insoluble condition which enables the color to withstand severe fulling. In applying the Chrome however it must be borne in mind that a 6% dyeing only really needs ¾% of Chrome at the most. Any excess oxidizes the black already formed and turns it reddish brown. The addition of the Chrome must be made in such a way that the entire lot will be evenly acted upon. The proper amount may be exactly calculated, but one quarter of the wool may receive it all, and thus be over chromed and reddish, while the remaining three-quarters will be undeveloped and not fast. The acid condition of the dyed wool causing the chrome to combine with it at once without any possibility of boiling it off and equalizing the lot.

Whether to chrome in a fresh bath or in the exhausted dyebath depends on the class of goods dyed. Piece goods and yarns should have a fresh bath, but loose wool, tops, etc., which are later to be washed may be treated in the exhausted liquor. If the shade of the average chrome black is too jet and reddish it may be corrected either with Diamond Green, Naphthol Green or Naphthol Blue Black.

The fastness to scouring is improved by the presence of Acetic Acid in the chrome bath. Fastness to crabbing requires Sulphuric Acid in the chrome bath, at the sacrifice of the tone of the color.

Silk and silk noils may be dyed fast blacks if one precaution is taken. After dyeing a full shade in an acid bath, with at least 15% of dye, have the chrome bath charged with about 2% of chrome and not over 120° F. Leave the silk in the chrome over night, then soap and brighten. Hot chrome will destroy the silk and color as well, but the above process is quite practical.

Protection of the Dyestuff Industry

This interesting article was sent to the REPORTER by a chemist who commented upon it as follows:

GENTLEMEN:

Enclosed is an article which appeared in a recent issue of the Boston "Transcript."

Having followed closely your editorial policy, I feel that you as well as your readers will be interested in its statistical value.

Very truly yours,

——— *Cotton Dyeing Co.*

W. B., Chief Chemist.

As a preliminary to recommendations to be made later for a revision of the chemical schedule in the Tariff Act of 1913, the United States Tariff Commission has made a study of the comparative uses and costs of dyes in the textile industry, which is the largest customer of the color maker and a large proportion of whose products depends upon color for salability. The information was obtained from 77 firms, of which 23 were cotton manufacturers representing about 47 per cent. of the total cost of dyestuffs and chemicals used by all the cotton mills in the United States; 25 were wool manufacturers representing 40 per cent. of such cost, 8 silk mills representing 10 per cent. of the cost, and 21 independent dyers and finishers. The report of the commission, which is just coming off the press, presents for the first time a statistical comparison of the use and cost of dyes in 1913, before the war, and in 1916, after the color shortage had been relieved in a measure by the desperate efforts of the American chemical plants to meet the demands made upon them for colors. The whole subject is so technical that an extended discussion of it is not practicable in these columns. It is a matter of common knowledge that the cost of dyes has increased beyond all precedent in the last four years, until now instead of being regarded as an almost negligible quantity in the marketing of textiles the manufacturer often must include the cost of colors as one of the important elements of price-making.

Average results in the four industries reporting may be stated as follows: In cotton manufacture the amount of dyes used has decreased 11.8 per cent. against an increase in total value of 241.5 per cent. In the three other industries an actual increase in quantities has taken place. In wool manufacture the increase in usage has been 72.4 per cent. and in cost 301.2 per cent.; in silk manufacture 19.8 per cent. in quantity against 232.4 per cent. in cost; and the dyers and finishers have used 11.4 more colors than in 1913 of a value 319.4 per cent. greater. Thus the four industries, although they used only one-third more colors in 1916 than

before the war, paid more than two and one-half times as much for them, or 287.4 per cent. The wide range of individual values of course cannot be indicated by figures of a general character. Thus the cotton manufacturers, although using 64 per cent. less synthetic indigo, for which they formerly paid 15 cents a pound, were compelled to pay $1.15 a pound for what they did use. Sulphur black went from 18 to 60 cents a pound and idanthrene blue from 27 cents to $1.00 a pound. These had been their largest items of color use. They were compelled to turn to the more unsatisfactory vegetable colors, and whereas in 1913 they had used no vegetable indigo, which consequently had no value in cotton mills, three years later they used nearly a million pounds and paid $1.98 a pound for it. The increased price was due in part to the fact that the natural product contains considerably more indigo than does the synthetic article in the marketed form of 20 per cent. paste. Most of the other natural dyestuffs showed a marked increase in use. Logwood went from 5 to 23 cents a pound, with an increase of 267 per cent. in quantity used, and almost twelve times as much fustic extract was used in 1913, at a price a little more than double.

Practically all the manufacturers who replied to the questionnair of the Tariff Commission testified that they were not compelled to shut down by dye shortage, although they had to resort to many adjustments which were unsatisfactory alike to themselves and their customers. As one manufacturer wrote: "As American manufacturers we are not ready to admit that as a nation we are dependent upon Germany for colors and chemicals, so we have kept going on substitutes and the consuming public has shown a disposition to cooperate." The manufacturers as a class pay discriminating tribute to the enterprise of the dye makers in trying to supply them with colors, and no doubt would speak even more warmly of their efforts if the latest productions of the American chemical plants had formed a subject of their comment. In fact, the two most remarkable presentations in this unique report are of the favorable opinions of the textile manufacturers with respect to American dyes and to the advisability of affording them adequate protection against German competition.

American sulphur black, which is one of the prime necessities of the cotton mills, received distinct praise from the cotton men. One manufacturer says: "The American-made sulphur black we are using has more tinctorial power than any German black we have ever used in the same class." Another testifies: "The sulphur black is just as good, and while the other colors are not as good they answer the purpose for which we use them, although not as fast or as uniform in shade." Says a third: "In most instances the American manufacturers have produced satisfactory substitutes for the imported dyestuffs." A more or less general opinion is expressed by the textile men of all four classes that "class for class" the American dyes are practically the same for fastness and quality and often for uniformity. They all stress the

suggestion that in making comparisons with the foreign product exactly the same classes should be compared; the general trend of opinion is that in the finer colors the Americans have not yet succeeded in matching the foreign product, although an occasional exception to this rule is cited. Says one big woolen concern: "We believe that ultimately our domestic color makers will be able to make almost every color needed. Just now, owing to the difficulty in obtaining intermediates, some of the rare colors (alizarians) cannot be made. These intermediates are contracted for far ahead at high prices for the manufacture of explosives. However, we are confident that when the latter demand ceases, the leading explosive manufacturers will turn at once and be able to supply the demand."

The silk makers appear to have had a little more than their share of trouble with the new dyes, possibly because of the delicacy of much of their product and the special demand for lasting colors. One concern complains that the American-made dyestuffs cannot be worked as uniformly as the imported products, with the consequent lengthening of process and possible injury to the fabric. However, the testimony of the silk men—as of the other textile men, for that matter—is by no means uniform. In a particularly discriminating reply one large manufacturer thus briefly states his case: "The American-made dyestuffs used by us in a very few cases are, in our own opinion, equal in quality, fastness and uniformity to the imported dyestuffs of the same class which we used prior to August, 1914. For example, acid orange and direct black have always been made in this country, and the former has, in many cases, even before the war, been furnished by American manufacturers to the German dyestuff importers. Such other colors as induline nigrosine, certain acid blacks, methylene blue, and methylene violet are also a good quality and uniformity, but we have had trouble, for example, with the lack of uniformity in shipments of fast and acid fuchsine. The quality of some direct yellows is not

equal to before the war purchases. It is difficult to find fast acid reds which dye level. American-made induline does not fasten as evenly in steaming after printing. We are very much interested in the progress of the American dyestuff industry and believe that eventually the objections similar to the above will be eliminated.

One silk man finds the American dyes lower in strength and brightness and not uniform, another says they are almost as fast and uniform but their tinctorial value is decidedly less, and a third declares that the American-made artificial dyestuffs are the equal of the imported of the same class as regards fastness and uniformity and from two to three times as strong. Obviously, it may be remarked, the textile men have had different experiences with different color makers. Moreover, although the Tariff Commission does not say so, it is well known in the trade that many fly-by-night concerns have gone into dye-making with the hope of huge war profits.

(*Continued next week*)

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DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

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The Abuse of the Patent Right

Since the "Trading with the Enemy Act" has been in force American manufacturers of synthetic drugs and dyes have found that there has been a serious breach of good faith in the past. The object of a United States patent is to cause a disclosure of the essential details of an invention, in return for which the inventor is granted a protection and a monopoly for 17 years. At the end of the term, in return for the protection, the patent becomes public property. While the Patent Office has been sustaining foreign patents and giving the necessary protection, it now finds that the specifications are, in most cases, misleading and the bargain has not been kept by the party of the second part.

The Federal Trade Commission has lately revealed its experiences with the drug Salvarsan which have also found parallel in the patents covering most of the German dyestuffs.

The favorite method has been to have several inventors, fictitious or otherwise, with various assignors to cover separate steps of the entire operation and have the trade name registered by still other parties. The patents themselves will contain the names of many substances and conditions that are supposed to be alternative processes, whereas in fact the reactions will only take place under conditions that are within closely defined limits.

In the case of Salvarsan, in England, a close adherence to the specifications in making the drug yielded a substance that actually caused over 200 deaths before the truth was realized.

It is therefore evident that if we are to utilize the German-held patents in this country we can only consider them as mere suggestions. We will have to work out the details on a practical scale before success is attained. Under such conditions it would seem that any later attempt to collect royalties could be successfully contested.

We have it from reliable authority that by applying to our Patent Office and naming the original German patent (D. R. P.) it is possible, for a moderate fee, to obtain a photographic copy of the original German patent. The German patents require the specifications to be in workable form and capable of demonstration, which feature is absent from our laws.

Our mechanial patents are quite strict and, by the drawings, may be judged by mechanical and physical experts before the patent is granted. The chemical and process patents need only state whatever the applicant sees fit to claim protection for, and there is no one whose business it is to discover discrepancies before the patent is granted.

The British law, which now requires the working of a patent, granted a foreigner, on British soil within a stated period, has been evaded in many ways.

Any revision of our laws might be along the lines of compulsory granting of licenses to American manufacturers and a demonstration of practicability before the patent became valid.

If such a law could be drafted and passed it would do more to foster the American dyestuff industry and prevent foreign competition than the most prohibitive tariff that could be levied.

Such a course is not a violation of ethics nor is it unjust. We have a right, more than a right—a duty, to protect ourselves from bad faith and absolute trickery.

Events in Europe have shown us how sacred are treaties, personal rights, international law, and even justice and truth, when self-interest is at stake.

We have an American self-interest and while we need not put it forth aggressively we can make it our strong first line of defense.

INQUIRY DEPARTMENT

American Dyestuff Reporter:

It is quite noticeable that the colors used for postage stamps are very sensitive to both light and other influences. Would it not be possible to provide the Government with faster dyes or pigments that would be more permanent?

The sensitive nature of the colors on stamps is intentional. On the other hand the cancelling ink is made as permanent as possible, so that if anyone attempts to remove the cancellation, in order to use the stamp again, it will be destroyed. The cancelling ink is made of a spirit black dissolved in glycerine and fortified with carbon black. This gives a color unaffected by chemicals and penetrates below the surface. The stamps are lakes of basic dyes easily affected by most chemical reagents.

American Dyestuff Reporter:

Which dyes can be used for coloring soap and how are they used?

All the Azo wool colors and most of the direct cotton dyes can be used, also Naphthol Green. In any case it is advisable to make the soap first and only add the color when the fat has been entirely saponified. Palm oil shades are made from a mixture of Azo Yellow or Tartrazine with Orange A. Olive oil shades with a mixture of Chrysamine and Direct Green. Liquid soaps require Naphthol Green, as this is the only product that will resist the alkaline effect when in solution. Milled soaps may be colored with spirit soluble dyes added, with the perfume, to the powder before compressing into cakes.

American Dyestuff Reporter:

Is it advisable to take up the manufacture of Wool Green S. Where is the greatest use for it?

Ever since the dye shortage began there has been a lack of greens, blues, and violets for wool that would be suitable for shading purposes. On account of the intermediates necessary for Wool Green S now being available it is only reasonable that it would soon make its appearance. The greatest objection to it as a dye is that it exhausts poorly, but on the other hand it dyes exceptionally level. As the shade is practically the same as Patent Blue A,

but duller, it has a wide range of usefulness, particularly among the dyers of carpet yarns and piece goods. The fastness to light is good, but it will not stand washing well. There always will be a demand for this dye, but when Fast Green Extra Bluish, Patent Blues and Acid Green GG are produced in quantity, they will displace it in many cases. Many manufacturers are likely now to take up this product and some domestic competition will be the result. At present the production depends on the supply of Michler's Ketone, which is somewhat limited.

American Dyestuff Reporter:

What aniline dye is used to give a pale grey stain on oak wood, known as silver grey? It must be perfectly even in color and fast to light.

While water soluble Nigrosine, fast shade, can be used for the purpose, it is customary to obtain this effect by the use of a 1 per cent. solution of Copperas (Ferrous Sulphate). There is always sufficient Tannin in the wood to develop a grey color which is quite permanent.

American Dyestuff Reporter:

I have a quantity of a black developer which is either Meta-toluylene diamine or Para-phenylene-diamine. Is there any simple test by which I can tell which it is?

Dissolve a small quantity in hot water and immerse a piece of wool yarn for a few minutes. Then put the wool in a dilute solution of Bichromate of Soda. A dark color will develop in both cases. If the shade, after rinsing and drying, is a khaki color, the product was Meta-toluylene-diamine, but if it is a grey or bluish black it was Para-phenylene-diamine. Exposure to light and air generally changes these substances into darker compounds. The former becomes a brown and the latter a purplish black.

American Dyestuff Reporter:

Is Methyl Violet 6B the same as Crystal Violet 6B, and if not, what is the difference and uses?

Strictly Methyl Violet 6B is an extreme blue shade of Methyl Violet, either made from a pure Dimethyl Aniline, free from Monomethyl Aniline, under favorable conditions or mixed with a basic blue after manufacture. Crystal Violet 6B is made from Michler's Ketone and is noted for the fact that, when pure, it forms crystals from concentrated solutions. The shade of the two violets may match perfectly, so that one can be used in place of the other for ordinary purposes. The great difference is found in the manufacture of copying inks and typewriter ribbons. Methyl Violets are difficult to grind in oil without gumming on the rolls, while crystal violet is more friable and may be easily ground in oil.

Germans Optimistic of Future Trade

The following statement appeared in the annual report of the German Color Combination:

"Owing to the length of the war, numerous competitive works have been established in neutral and enemy countries. A hard struggle with them is bound to come after the war.

"Sacrifices will undoubtedly have to be made; nevertheless the future position may be regarded with confidence."

New Officers of National Aniline & Chemical Company, Inc.

At the adjourned meeting of the Board of Directors of the National Aniline & Chemical Company, Inc., held at the offices of the Company, 244 Madison Avenue, New York, on Tuesday, March 12th, the following officers were elected for the ensuing year:

William J. Matheson, President and Chairman of the Board.

Dr. William Beckers,

Robert Alfred Shaw,

I. F. Stone,

Dr. L. C. Jones,
Vice Presidents.

Henry I. Moody, Treasurer.

G. W. Yates,

T. S. Baines,
Assistant Treasurers.

William T. Miller, Secretary.

W. E. Rowley, Assistant Secretary.

Henry Wigglesworth, Chairman of the Executive Committee.

The changes that will be noticed in the official staff have been rendered necessary by the decision of the Messrs. Schoellkopf to withdraw from all active management. This decision of the Messrs. Schoellkopf to decline re-election as officers of the company resulted from differences as to the general policies of the company. These gentlemen will retain their large stockholding interests and their places on the Board, and will continue to give the Company the benefit of their experience and advice. Mr. J. F. Schoellkopf and his brother, C. P. Hugo Schoellkopf, are the real pioneers in the coal tar color industry of this country, aided in recent years by the able co-operation of Dr. J. F. Schoellkopf, Jr. They maintained a color business here against every discouragement from 1879 until the outbreak of the great war when the blockade of Germany presented the opportunity for their long deferred and much deserved financial success. It is no exaggeration to say, that the Schoellkopf Company in 1914 was one of the two factors which saved from disaster the textile and other trades dependent on the use of dyestuffs. These two factors were the Aniline Oil produced by the present National Company's works at Marcus Hook and the Direct Black derived therefrom by the Schoellkopfs. In the formation and organization of the National Aniline & Chemical Company, Inc., the Messrs. Schoellkopf associated themselves with men connected with the W. Beckers Aniline & Chemical Works, Inc., the General Chemical Company, the Semet-Solvay Company, and The Barrett Company, all concerns of prominence in the chemical trade, and also with Mr. William J. Matheson, the new President—a Director in the General Chemical Company—and for many years the active head of a large company engaged in distributing the colors of one of the five great German producers. The burden of carrying forward the National Aniline & Chemical Company will now fall upon these men. Dr. L. C. Jones, whose name appears for the first time as a Vice President, is Chief Chemist of the Semet-Solvay Company and Solvay Process Company and he brings to the National Company great strength as chemist and executive.

Testing of Sumac Extracts

We first prepare as a standard a solution of pure tannic acid made to contain one-tenth per cent tannin; also a solution of Indigotine, about 3 per cent of indigo extract in water.

First, it is necessary to ascertain the relative value of these two solutions. In order to do this, 20 c.c. of the Indigo are put into a white porcelain dish with about one liter of distilled water, with a few drops of sulfuric acid; then permanganate of potash solution is run into this indigo extract solution until the liquid turns pale yellow. This operation is now repeated with 10 or 20 c.c. of the pure tannic acid as prepared above; upon deducting the c.c. obtained in the first experiment from the c.c. obtained in the second, the quantity necessary for the oxydation of the 20 c.c. of the solution of tannic acid is obtained.

The relation of the permanganate to the indigo solution should be such that about an equal number of c.c. of each

is required, that is to say, the process works to its best advantage when about 20 c.c. of indigo extract require 20 c.c. of permanganate, and when 10 c.c. of the permanganate of potash requires 10 c.c. of the tannic acid as described.

About 5 grams of the sumac extract under examination is weighed out, dissolved in pure water, and raised to one liter. Then 20 c.c. of the indigo extract solution is poured into the white porcelain dish along with a few drops of strong sulfuric acid, with 30 c.c. of the solution of sumac extract, and the whole is raised to one liter. Then the permanganate of potash solution is run in from a burette until decolorization is effected. For example 10 c.c. of the solution of permanganate of potash corresponds to 20 milligrams of pure tannic acid; 20 c.c. of the indigo solution are decolorized by 20 c.c. of permanganate of potash solution. Five grams of sumac extract have been dissolved, as it has been said, in one liter of water; 30 c.c. of this solution of indigo has required, we will say, 40 c.c. of permanganate of potash to decolorize it; therefore, as 20 c.c. of indigo solution are decolorized by 20 c.c. of permanganate of potash, the remaining 20 c.c. (40 less 20) of the decolorizing solution has been necessary for the oxydation of the tannic acid in the sumac extract.

Standardization

IT would seem that the subject of Standardization of dyestuffs touched a responsive chord among the consumers and it is not likely to be forgotten. We have just received a copy of the Pulp & Paper Magazine of Canada containing an article written a few days before the recent meeting of the dyestuff association. The news of the change in policy of the association had not yet become public and consequently the view of this important organ of the paper industry is more interesting.

"It is upon this question that the meeting is expected to concentrate its work. Those who are interested in the dyestuff industry of the United States are becoming more and more convinced that standardization is the very keystone

of the industry! There are some manufacturers who even believe that, unless standardization of product comes before the end of the war, the American dyestuff industry will not be able to survive.

"American dyestuff manufacturers have complained of the lack of interest manifested in the fate of the dyestuff industry by users of dyes here, and the apparent lack of confidence on the part of these dyestuff users in the quality of American dyes. There is no doubt, it is thought in some centers, that the bulk of the American paper manufacturers still have little faith in American-made dyestuffs despite all that has been accomplished during the war. This lack of faith has resulted from actual experience in handling American made dyestuffs, which having never been standardized, are not at all uniform in their results."

"It is unfortunate that this situation has arisen, but it is said to be a situation that can be remedied, provided the dye-stuff manufacturer will standardize his product so that, when the user buys dyestuffs of a certain number, he may be sure that this dye will give the same results as it did when bought previously from the same producer. Whenever the basic colors have been thoroughly standardized to one standard by American manufacturers, they will find that the users of American dyes will be their strongest friends and supporters. This confidence, naturally, would go down through the paper industries and be fully shared on merit by the jobber and others so that they too, could re-order American dyed goods in the expectation of getting uniformity; of getting exactly what they had before.

"One of the big men in the trade ventured the opinion that, with the American dyestuffs, apparently, it must be standardization or elimination."

Protection of the Dyestuff Industry

(Continued from last week)

A striking feature of the report is the practical unanimity with which all the textile mills now agree that the American dye industry should receive adequate protection.

It is violating no confidence to say that the experts of the tariff commission do regard the present dyestuffs tariff as a workable or well-informed piece of legislation. It is not their business to recommend policies to Congress, but Congress already having determined to protect the color and chemical trade, it is the function of the tariff commission to make suggestions for the perfecting of the law. This shortly will be done, after the country has been combed for the experiences and opinions of makers and users of dyes with respect to the defects in the law. In its present report the textile men do not go elaborately into an analysis of the law which, many of them point out, has been practically inoperative because imports under it have been negligible within the last three or four years. But it represents a remarkable change of opinion over 1908-9 and a practical crystallization of the attitude of the users of dyes before the ways and means committee in 1913, that these representative textile men should with virtual unanimity urge that suitable protection should be afforded the color trade even if a substantial increase in the cost of one of their most necessary raw materials should result. "Never again" describes the sentiment of the textile men with respect to the dye storage and the almost total lack of an American dye industry to prevent its recurrence. The textile men make it clear that the least the Government can do is to make German dumping an impossibility. One large cotton manufacturer thus puts the situation in a nutshell, and in a manner which may be accepted as representative of general opinion throughout the textile trade: "The best interests of the American worker, producer and consumer require that raw material, finished dyestuffs and dyed goods shall be put upon such a parity as to duty as to develop the American production and protect the American manufacturer. The developments of the last three years have shown clearly the necessity of the upbuilding of a dyestuff industry.

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MYRON DREW REESER, Managing Editor

What the British Have Done

WHILE we are daily hearing rumors of the new dyes to be produced in America, "sometime soon" our additions to the line are not keeping pace with the English factories.

Some of our factories make the dyes that sell in large quantities, others make some that yield larger profits and some factories make a line needed for their own consumption and sell the excess. Naturally there must be a motive and an interest before any commercial enterprise can obtain capital to support its efforts, but if the Germans had adopted such a policy they would not have made much progress. Everyone is probably familiar with the work of Adolph von Baeyer, who spent so many years and millions of marks in the development of synthetic Indigo, only to be compelled to repeat the work because the world's supply of toluol was insufficient.

The Solway Dyes Co. of Carlisle Eng. have issued a statement showing that they have been producing vat dyes in commercial quantities for some time past and give a list of the German types which they have duplicated, as follows:

If this can be done in England what is the reason America has been content to make only the more simple colors? Can it be that our capitalists are in fear of the lack of support that will be given by Congress? England is in dead earnest and has actually subsidized the dye industry whereas in this country we have neither adequate patent or tariff protection to meet the conditions that will surely arise after the war.

As it is, every smaller manufacturer feels that he must make what he can while the war lasts. He must be cautious regarding expenditures for equipment and must always feel that his business is subject to conditions that may wreck his enterprise at any time. He does not know whether his supply of raw materials will be cut off at a day's notice or what other unfavorable legislation will be enacted. While it is earnestly hoped that the new Dyestuff Association will be able to gain for the industry at large a proper recognition, the task is a large one. We need the best kind of support and assistance of the press all over the country because it is necessary to make Congress and its various committees understand the needs of the industry. If the fact can be made clear to all that the British factories are doing such good work, because they have the right kind of Government support, it may happen that we will get some recognition. We congratulate the English, they are our allies in war, but after the war we will need the moral support of everyone in the country for our own success.

	Solway Dyes Trade Names	*Date Produced by Solway Dyes*
Indanthrene Yellow G	Caledon Yellow	Small Quantities in Nov., 1914 Bulk in Feb., 1915
Indanthrene Blue	Caledon Blue	March, 1915
Indanthrene Dark Blue BO	Caledon Purple	April, 1917
Indanthrene Green B	Caledon Green	April, 1917
Indanthrene Brown BB	Caledon Brown	April, 1917
Idanthrene Red BN	Caledon Red	August, 1917
Idanthrene Pink B	Caledon Pink	August, 1917
Idanthrene Violet B Extra	Caledon Violet	August, 1917
Alizarine Sapphirole	Solway Blue	March, 1916
Alizarine Cyanine Green	Kymric Green	July, 1917

Chrysophenine Now Offered

The Essex Aniline Co., Inc., of 50 Congress street, Boston, announce that they have succeeded in manufacturing on a commercial scale and are now making deliveries of Chrysophenine, according to the *Textile World Journal.* This is a distinct and somewhat notable industrial achievement, and is one step further toward breaking down the German monopoly established in high grade colors. Chrysophenine is a bright, direct yellow applicable either to silk, wool or cotton. Prior to the war, it found much use in China in dyeing the Imperial yellow much in vogue in that country. It is fast to light, washing, weak chlorine solutions and weak alkalies. It is valuable to cotton printers as a discharge color. The Essex Aniline Co. claim this color to be equal to best German manufacture both in brilliancy of shade and economy of use. In the fiscal year 1913-1914, imports of Chrysophenine from German, Swiss and Belgium sources aggregated 148,249 pounds. Small quantities have been brought in from Switzerland from time to time.

Du Pont Offices Now Located in New York

The E. I. du Pont de Nemours Company has leased three floors in the new twenty-three story building at 21 East Fortieth Street, New York. The company has taken the second, third and fourth floors as executive offices and selling departments of several of its large subsidiary concerns, including the Bridgeport Wood Finishing Company, manufacturers of paints and varnishes, which will occupy one of the floors together with offices for representatives of the principal lumber concern of this country. The Arlington Company, manufacturers of celluloid products, will occupy another floor and in the Du Pont Chemical, the Fabrikoid Company, makers of imitation leather, and Harrison, Inc., pigment manufacturers, will have the remaining floor, involved in the lease of which aggregate a net space of 11,000 square feet, which has been rented for a number of years.

A Recent Dyestuff Meeting

A meeting of manufacturers of dyestuffs was held recently at the Hotel Biltmore, New York City.

The most important question up for discussion was the open price policy, and little opposition was met.

A full report will follow in the REPORTER issued the 25th and until that date we prefer to make no definite statement other than to say that this movement is in perfect accord with the plans thought out at the meeting on March 6th and as one manufacturer puts it, "It is simply the case of one wheel within another, both working in accord."

Chemical Man Ordered Interned as Veteran Spy

Wilhelm Andreae, a German, connected with the A. & B. Export & Import Corporation of 78 Wall street, New York, has been ordered sent to Fort Oglethorpe, Georgia. The Federal authorities suspect that Andreae

has been serving the Prussian secret service for twenty years. The prisoner came to this country from Germany in 1915, when the empire was permitting no one of military age to leave except for special reasons. He was in Paris in 1914 and left that city hastily one week before the opening hostilities, which caused the authorities to suspect that he had received a notice from the German military authorities recalling him.

According to the *Chemical Oil Daily* Andreae started the A. & B. corporation in 1917. Previous to that he had been employed in the local office of Ralph L. Fuller & Co., for about five months. That connection was preceded by a position with the E. R. Dick Chemical Company, since absorbed by other interests.

Previous to 1914 Andreae spent some 15 years in Mexico where, the officials say, he was connected with a German banking concern which was part of the great Teuton propaganda system. Examination revealed the fact that one brother is now serving in the German army, while another is interned in England. Other relatives are connected with the German military organization.

Andreae was arrested on Wednesday evening on a Presidential warrant.

German Dye Patents Applied For

Application has been made by the du Pont interests to the Federal Trade Commission to manufacture dyes under German-controlled patents under "trading with the enemy" act. These include a patent controlled by the Farb werke Hoechst Co and one on a process controlled by the Roessler interests in Germany. Also application for manufacture under fourteen patents held on assignment by the Badische Anilin & Soda Fabrik has been made by the du Pont Company.

Safranine

A manufacturer with headquarters in New York City is now offering to cotton mills a particularly good Safranine. This product is the real red-yellow shade and is equal to the pre-war type. The plant is now averaging 1,000 pounds a week and equipment is being added to increase the output.

Dye Industry In Need of Publicity

Future Depends on Confidence

By M. D. C. Crawford

R. H. Macy & Co. announced last Sunday in the daily press a sale of 6,800 yards of "imported ratine *dyed with foreign dyes.*" This advertisement, in itself insignificant and referring to a trifling quantity of goods, should be of vital interest to the great American dye industry.

Progressive business executives and skillful physicians should have at least one trait in common. They should be extremely attentive to the first indications of dangerous symptoms. The business man has a great advantage over his scientific neighbor, in that he can adopt preventive measures that

may forestall serious later complications.

Surely at so early a date, and after such a truly wonderful advance in America of the dye industry, the fact that a great retail store feels that emphasis on the word "foreign" (as connected with dyes) has a definite sales appeal, is to be classed among the dangerous symptoms.

I hasten to add that in my judgment R. H. Macy & Co., in printing this advertisement, were well within their rights. The goods in question were exactly as represented, and the owner of merchandise has an inalienable right to advance any truthful reason that will in his judgment facilitate a sale.

The point is that American dyes, to the average person, even to the professional buyer of fabrics, are a more or less uncertain quantity. In a general way, the great progress already made, and to a less extent the promise of the near future, in this vital industry are known. But the time has come for definite knowledge; if the industries using the finished products containing dyes are to have the proper confidence in American dye products, they are entitled to know more. Confidence is built upon knowledge. Frankness in one's self begets assurance in others. The chemists' skill will make dye, but only confidence among other industries will make the dye industry continuously profitable.

Future of Industry Based on Confidence

The future of the dye industry in America, together with the vast and important industries that are co-related, must be built upon the intelligent confidence of buyers of fabrics and garments in this country. Without this confidence, all the technical skill, all the marvels of courageous science in this field will either be of no avail or will defer their rewards indefinitely.

Modern textile production has become so extremely technical that in every field the specialist is supreme. It is impossible for any one man to be proficient in each phase of so intricate a subject. And the nature of all chemical subjects are especially pertinent examples of specialization. The average expert mill superintendent, converter, or buyer and, I may add, editor, could not follow a chemist for five minutes in the simplest technical discussion. Any of these individuals are perfectly willing to leave all the points of direct technical import to the proper people. When it comes, however, to the final results and their relation to the problems pertinent to the other specialists, there is another story. Formulas belong to the chemist in toto, but occasional discussions of finished results, detailed information as to progress made, comparison with pre-war conditions: these are points upon which the chemists should be utterly frank. And this information should be assiduously spread among the public. Before serious damage can be done, a thorough educational campaign is the proper order of the day.

American Dyes Usually Satisfactory

In the face of uncertainty, people are prone to forget not only the fact that American dyes so far have been gener-

ally satisfactory, but also that even in the old days certain processes were rather uncertain. They are too likely to become, not only supercritical of present conditions, but with their fondness for distant lands, become oblivious to past delinquencies. For this gradually forming and erroneous mental condition, there is but one cure—truth. The breath of publicity must sweep away the vapors of suspicion. Surely the dyers of America cannot forget the patience and forbearance of the public at the beginning when the condition of the color trade was frankly discussed in a popular way. The same remedy must be applied again.

Expansion and Publicity Imperative

The dye industry has two definite problems before it. First, it must continue to expand commercially and technically. No effort should be spared to bring every vital phase up to the highest standard. Nothing short of world leadership in this, as in other industries, is a true goal.—*Times.*

Dye Patent Bartered

British Claim German Formulas Have Come to America by Purchase

A special dispatch from the Oil, Paint and Drug Reporter Washington Bureau says:

Unconfirmed reports from London to the effect that Great Britain "has lost its opportunity to recapture the dye industry" through the sale of German dye formulas by Levinstein, Ltd., has created considerable discussion in the local trade because of the fact that it is stated by the London press that Ellesmere Port formulas were sold to the du Ponts for the sum of £250,000, an American dye firm getting secrets which British Dyes, Ltd., the government subsidized industry of Great Britain, were anxious to get, but from which they were barred by the sale of the Ellesmere Port works to Levinstein, Ltd., of Manchester.

It is charged in consequence that for the sum of £120,000 the British Board of Trade sold a virtual British monopoly of dyemaking, and that the injury to British Dyes, Ltd., may prove fatal, since had they been permitted to purchase the Ellesmere Port Works the German processes handed over with the plant would have been kept in Great Britain. If, as has been stated, the Levinsteins have sold to the du Ponts these secrets for the sum named, they have receivd more than double the amount paid by them for the Ellesmere plant.

It is interesting to note in this connection that it is reported at Washington that the du Ponts have successfully made a first run of indigo blue, an article up to the Swiss and German standard, and that while it has been extremely difficult to follow out the German formulae owing to incompleteness of the patent forms, the work has been accomplished with entire success.

The idea that the du Ponts have successfully produced indigo blue by a German formula, as reported, has not impressed chemists here as a feat worthy of special note. Among the leading men connected with the Ex-

plosives and Chemicals Committee of the Council of National Defense the methods used by the du Ponts are not known, they say, but Professor Bogart of Columbia University declared that in his own laboratory his students had frequently done this same thing.

There are at least 200 patents for German indigo blues and they are not regarded as difficult to apply.

Notes of the Trade

The Aetna Explosives & Chemical Company, Huntingdon, Pa., is planning for the construction of new additions to its plant at Mount Union to cost about $500,000. The plant will be especially adapted for the manufacture of dyes and chemicals after the close of the war.

The Chemical Production Co., Los Angeles, Cal., is building a plant for the manufacture of soda ash at Owens Lake, Cal.

The Gray Industrial Laboratories, Elizabeth, N. J., have been incorporated with a capital of $125,000 to treat chemicals. Incorporators: Thomas T. Gray, Frank A. Urner and F. B. Mason, all of Elizabeth.

The Krayer Chemical Co., Elizabeth, N. J., has been incorporated with a nominal capital of $5,000, to manufacture chemicals. Incorporators: S. E. and A. Krayer and Clarence S. Myer, Elizabeth.

William A. Rogers, Joseph F. Curtin and Philip L. Nieser, all of New York City, have incorporated the Williams Chemical Corporation, under the laws of Delaware, with a capital of $10,000,000.

The Products Trading Co., dyes and chemicals, New York, has recently been incorporated with a capital of $10,000 by H. Parkus, F. Mendelssohn and M. Levy.

Frederick H. Cone, large distributors of chemicals, who for a long time have been located at 176 Front street, have moved to 181 Front street, at the corner of Burling Slip, New York, where they own and occupy the entire building. The new building is up-to-date in every respect.

The Stubner Chemical Works, Inc., Elizabeth, N. J., has been incorporated with a capital of $100,000 to manufacture chemicals and allied products. Incorporators: M. M. Clancy, C. L. Rimlinger and C. M. Egner, Wilmington, Del.

The Anthony-Hammond Chemical Works, New York, has increased its capital stock from $100,000 to $250,000.

The Chemical Co. of America, New York City, announces that the company has commenced the production of a new product called aerolacq, which is used to fireproof the wings of airplanes.

AMERICAN DYESTUFF REPORTER.

GENTLEMEN:—The action taken by the manufacturers representatives at the meeting on March 6th is unquestionably the correct one at this time. The infant dyestuff industry of this country must develop and reach the position where it can meet the requirements of the color consumers squarely and not with makeshifts. How it has met these requirements will be the test of its fitness to survive after the war.

It would be foolish to expect the consumers hearty support or the tariff policies of an industry only partially meeting their requirements, so the real problem of the industry is the best way to reach the point where there will be no question of the consumers complete confidence.

The formation of an association of manufacturers exclusively is the first step toward accomplishing collectively what we could not hope to do individually and if we can draw even closer together along the Institute idea we can eliminate a lot of lost motion and avoid the duplication of effort that is now rampant in the industry.

We are engaged in the formation of an industry here whose great success abroad was essentially due to specialization and manufacturing cooperation and we too must proceed along these lines. Generalization has been holding us back; the way to advance has been shown.

There is no industry in which consumers and manufacturers have been in closer touch. Special products were developed to meet special needs, the consumers became educated in the use of special classes of colors for special work and in turn educated the consumer of the colored materials. These are the conditions we are facing and the problems to be solved are not distribution problems in any degree. The consumers know what they want and so do we.

The omission of the dealer at this time is therefore logical. On the other hand the inclusion of the reputable dealer along with the allied industries seems to be so desirable that it may later be a subject for special consideration.

In the past some dealers were regular offenders in the use of questionable selling methods. Nearly all imported up to the restrictions imposed by their ability to compete with the American branches of the foreign manufacturers. Those who will revive the old methods or deliberately seek foreign sources of products made here have no place in any American association.

Yours very truly,

MARDEN, ORTH & HASTINGS CORP.,

Per C. A. Mace.

AMERICAN DYESTUFF REPORTER.

GENTLEMEN: — In connection with the action taken at the meeting of dyestuffs representatives at the Chemist's Club on March 6th, in organizing an association of manufacturers, I believe this was the only logical action that could be taken at the time in the best interests of making permanent the dyestuff industry in this country.

One of the gentlemen representing the dealers implied in his statements

that the manufacturers were throwing out the dealers and intended to market their wares direct to consumers. I believe this was an erroneous conclusion and not based upon foundation in fact.

The manufacturer should not be regarded as an individual whose purpose it is to destroy the dealer and specific instances of such action should not be accepted as representing collectively the spirit of the manufacturers of the country.

There is a disposition on the part of large consumers to go direct to manufacturers for supplies and this tendency is increasing. This is but a natural step in the evolution of economic development and no amount of uneconomic opposition can stop it. It does not follow, however, that because a manufacturer sells direct he will refuse to sell to a dealer. Such action could only result if the dealer proved incapable of marketing the manufacturers' wares within a territory and on a scale that was within the capabilities of the manufacturer himself.

For ourselves we are perfectly willing to sell to dealers, but if we only sold the amount of our goods that dealers dispose of we would not now be in business. The business we have in oil soluble colors is almost entirely the result of large consumers coming direct to us. Our experience with dealers mainly has been in the line of furnishing them with innumerable samples from which we never hear.

If the dealer can demonstrate that he is an important and vital instrument in making permanent the dyestuff industry he certainly must be accorded recognition, but it must not be advanced as a reason for placing him in the plane with the manufacturer that if he is not taken in he will destroy the manufacturer by concentrating his efforts upon tariff reduction and encouraging importation of foreign made products. Such a position is unsound and untenable and probably would not be adopted by representative dealers.

There has been a suggestion that the intent of the large manufacturers is to put out of business the small ones. The disposition of any manufacturer is to get all the business he can and it is but natural that the largest should be able to produce his goods at the lowest cost. This would put a small manufacturer out of business in legitimate competition, and if he goes down he should not charge his ruin to his competitor. The small manufacturer who has some particularly good product I believe is more likely to acquire the respect and support of the large manufacturer than one who is not able to compete on products of equal quality.

As to the question of obtaining business by unfair competition, it would seem that the only remedy is first to determine what really is unfair competition and what is encompassed within the meaning of the term and then devote our energies to enacting and enforcing such federal regulation as will discourage it. We are arriving at this slowly but surely and in the meantime there will no doubt be martyrs to the causes as in all processes of evolution. Don't be discouraged but be cheerful and keep your weather eye on regulation.

Very truly yours,

ALFRED SPICE, *President.*
Sizing Specialties Co., Inc.,
Jersey City, N. J.

The C. & S. Chemical Company, New York, has been incorporated with a capital of $10,000 to manufacture chemicals. J. Cassell, J. H. Weinberg and C. E. Benoit, 19 Cedar Street, New York, are the incorporators.

Application for license to use certain blue dyes for which patents were issued to German companies, has been made by the Du Pont Co.

AMERICAN
DYESTUFF REPORTER

A Weekly Publication devoted to
DYESTUFFS, COLORS and ALLIED CHEMICALS
"Circulated Everywhere Dyestuffs are Used"

Vol. 2 New York, March 25, 1918 No. 8

War Trade Board Places Limit on Imports

WAR TRADE BOARD experts predict the restriction of imports on the articles listed, will save 1,500,000 tons of shipping a year, reckoning on a deadweight cargo basis. The saving may be higher, they say, because several of the commodities are bulky and take up more ship space than others. The saving on metals will be about 600,000 tons.

In this connection, it is noted that the board feels confident the War Department will be able to find enough iron pyrites in this country to maintain the sulphur supplies urgently needed in munitions making.

The War Department has been working for months to develop new pyrites fields for the sake of the sulphur and sulphuric acids dependent on pyrites. No high explosive can be made without this acid, of which there has been a shortage. Last year about 207,000 tons of pyrites were imported from Spain and elsewhere. Probably 125,000 tons will be imported before October 1, this year, after which importation will be cut off completely.

The following is the list of restricted imports. No. 1:

NOTE: *This list contains many products in which the mills are not interested, consequently they are not mentioned. The products that do interest are the following:*

All acids, muriate of ammonia, all coal tar distillates except synthetic indigo: fusel oil or amylic alcohol, citrate of lime; all salts of soda except nitrate of soda and cyanide of soda; sumac, ground or unground; artificial silk, non-mineral paints and varnishes.

American concerns seeking to import any of these articles will have to submit their applications to a rigid inspection. The applications will not be granted except under these circumstances:

"1. When the articles are actually shipped from abroad prior to April 15, 1918.

"2. When coming by rail from Mexico or Canada, when the goods originated in those countries or in others from which such goods are being licensed for import.

"When coming as a return cargo from European points and then only (a) when coming from a convenient port; (b) when loaded without delay and (c) when the importation from Europe is not specifically prohibited in said list."

In further explanation of the procedure to be followed, an official statement, issued to-night, says:

"In the future, therefore, applicants for licenses to import articles mentioned in the list will be obliged to show in their application the exis-

tence of such of the facts above outlined as will warrant the granting of such licenses. In the case of shipments from European points, the most satisfactory evidence will be proof that shipping space has been actually engaged. The present form of application for import license will generally be found adequate for this purpose, and where this is not found to be the case, a letter setting forth the additional facts should accompany such application.

"United States Consuls have been instructed not to issue consular invoices on and after April 15, 1918, for the articles mentioned in the list without first being furnished with the number of the import license or being given other evidence of the issuance of such license. Shipping agencies are also advised not to accept for shipment consignments of the articles mentioned in the list without similar evidence of the issuance of the import license. This applies only to the articles mentioned in the list. No proof of the issuance of the import license for articles not so mentioned is to be required either by consuls before issuing consular invoices, or shipping agencies in accepting freight. It will devolve upon importers, therefore, to advise their shipper abroad by letter or cable, of the number of their import license so that such shipper will be able to furnish the same to the consuls and the shipping agencies. This will mean that importers must be communicated abroad in ample time.

"It should be borne in mind by importers that the publication of this list in nowise relieves them of the necessity of applying for license to import articles not on the list, as all commodities require an import license except such as are now permitted to be imported under general licenses."

Statement Regarding Dyestuffs Association.

The following statement was issued by Benjamin M. Kaye, attorney for the Dyestuffs Manufacturers Association:

"The Board of Governors of the American Dyestuffs Manufacturers, who were elected at the meeting of the proposed association held on March 6th, at the Chemist Club, New York City, held their first meeting on Tuesday, March 19th, at the office of their counsel, Benj. M. Kaye.

"Formal resolutions were adopted providing for the filing of a Certificate of Incorporation in the State of New York under the name of 'American Dyestuff Manufacturers Association.'

"A committee of three was appointed, consisting of Frank Hemingway of Frank Hemingway, Inc., Dr. J. Merritt Matthews of the Grasselli Company, and Elvin H. Killheffer of the Newport Chemical Company, to work out the details of the Certificate of Incorporation, Constitution and By-Laws.

"The general principle was again annunciated that this is to be a thoroughly American Association, consisting of American manufacturers working with American capital and

doing their manufacturing in America.

"The Board of Governors is to meet again at the office of its counsel on Friday, March 29th, for the purpose of adopting a final form for its Constitution and By-Laws, after which it will proceed rapidly with its activities in establishing the Dyestuff Industry firmly in this country."

Mr. Kaye stated that at the meeting to be held on March 29th, permanent officers will be elected.

Calco Chemical Company Absorbed by Marden, Orth & Hastings Co.

The Marden, Orth & Hastings Corporation, manufacturers of chemicals, tanning materials and oils, has recently obtained control of the Calco Chemical Company, a $7,000,000 corporation of New Jersey with sales headquarters in New York City. The Calco Company was incorporated in 1916 and is engaged in the manufacture of dyestuffs, intermediates and other chemicals at their plant in Bound Brook, N. J.

Synthetic Indigo Plant Now Being Erected by the National Aniline & Chemical Company, Inc.

This plant, it is claimed, intends to cover at least half the requirements of the United States. Much of the equipment is now on the ground and is in course of erection. The buildings are now mainly completed. A few months hence it should be possible to undertake contracts for specific deliveries. The development of this important chemical industrial problem has been coordinated under the direction of Dr. E. S. Johnson of the Semet-Solvay Company, and Dr. Robert M. Strong, Chief Works Engineer of the Marcus Hook plant of the National Aniline & Chemical Company. When the European War broke out and the supply of indigo (an essential staple of the American textile colorist) was threatened with elimination, the General Chemical Company, The Barrett Manufacturing Company, and the Semet-Solvay Company, recognizing the chemical catastrophe represented by the lack of indigo, entered upon its cooperative development. Research men from each organization were delegated to conduct the necessary experimental investigations, and about eighteen months were consumed before, in the matter of quality and yields, the product of the great German plants had been equalled. A semi-commercial operation is now producing small quantities of indigo, in connection with the extensive installation which is under way at Marcus Hook.

Inquiry Department

AMERICAN DYESTUFF REPORTER:

How can Azo Fuchsine be dyed on silk?

It is evident that you have been having difficulty in getting this dye to exhaust. The reason is simple—this is one of the few acid dyes that have so little affinity for silk that in wool goods with silk stripes the silk is left white. It is not considered a very practical dye for silk on this account but, if you must use it, use Formic acid in liberal

amount and give in plenty of time and heat. The dye will wash off easily and it would be better to select some other coloring matter that has a better affinity for silk.

AMERICAN DYESTUFF REPORTER:

Is there any difference between the Benzo, Chicago and Diamine sky blues?

There are several types of each which differ in brilliancy. All 6B blues are not identical, but seem very close matches in shade. The corresponding types of each factory are identical, but not with the other types.

AMERICAN DYESTUFF REPORTER:

When an Olive Drab dyed for Government goods turns reddish in the soap and soda test what is the reason?

There may be two reasons for this. Either the black or blue used for shading was not fast or some vegetable extract was used to obtain the yellow tone. Observe the soap liquor and if it is tinted blue or violet the blue dye is the probable cause of the trouble. If the soap liquor is untinted and if the proper color returns after soaking in acetic acid the yellow may be suspected. All the vegetable extracts turn reddish and are forbidden at present. They are generally quite fast in other respects and there is no reason to object to them. If the regulations permitted their use many mills would use them more extensively than at present.

AMERICAN DYESTUFF REPORTER:

Is it possible to remove the indelible ink used by laundries for marking linen?

The laundries themselves use liquids sold for this purpose. They usually consist of two liquids, the first a mixture of Aniline oil, Phenol and Acetone. The second is a solution of soap in Denatured Alcohol. The mark is soaked in the first liquid for about ½ hour and then wrung out and before becoming dry the second liquid is applied and immediately followed by a washing in warm water and soap. The first liquid dissolves the coloring matter but is not easily soluble in water. The second liquid combines with what is left of the first liquid and puts it in a condition to form an emulsion with soap and water. The dyestuff being loosened is then easily washed out. This process will not answer for ordinary ink or many other stains, but it quite efficient for Spirit blacks and basic dyes in general.

AMERICAN DYESTUFF REPORTER:

What is the distinction between a blue black and a jet black and which is more economical to use?

All the straight dyes that are sold as blacks are either blue-blacks, green-blacks or violet-blacks. In full shades the blue-blacks are most pleasing for some unaccountable reason. As the quantity of dye necessary to make a full shade is greater, according to the brilliancy of the black, it has been found profitable to make jet blacks by destroying the brilliancy by the addition of reddish orange. A jet black in full shades has no overtone, and in pale shades is neutral grey. For piece goods an overtone is desirable, but for stripes and black and white mixtures depth is the main consideration. Hats are generally jet blacks as is also leather. Any attempt at making a jet

black which oversteps the mark and gives yellowish or reddish overtones is quite unsightly and often bronzy.

AMERICAN DYESTUFF REPORTER:

How can I tell whether a direct pink is a true pink or only a reduced red dyestuff?

There is no distinction between a pink and a weak red providing the tone of the color is correct. With dyes like Erika, Brilliant Geranine, Diamine Rose and Rhodamine they have been regarded strictly as pinks and seldom used as full shades because their brilliancy made them more useful in pale shades. When full brilliant shades were required it was found that less expensive and less brilliant reds would give practically as good results. A brilliant bluish red, when reduced, is a pink or rose but if it has not a full degree of brilliancy the tone will be dull and slaty. Any given dye may be identified and its proper name discovered but there is no distinction as to which shall be designated as reds and which are pinks.

Fast Black on Cotton Hosiery.

Gentlemen:

I am enclosing an article that appeared in the March issue of "The Dyer and Calico Printer" which, I hope, will help those mills that are responsible for some of the hosiery we from time to time receive. Happily most of the goods we export is well dyed, but there are a few exceptions. We know that good blacks are now being manufactured in this country, and if these dyes are used no trouble should be encountered.—Export Agencies.

FAST BLACK ON COTTON HOSIERY

Notwithstanding the many blacks that have been produced during the past twenty years that were claimed to possess the same shade and other properties of aniline black or fast black, the fact remains that a properly dyed aniline black is still regarded as the standard against which all other blacks dyed upon cotton are compared and judged.

Aniline black dyeing is essentially a trade by itself, and to acquire pro-

ficiency and skill in it demands long practice, painstaking care, and close observation of details. It should be remembered that fast black dyeing is not a matter of recipes or formula, but of knowledge gained by actual experience over the dye kettle.

Formula can only serve as a guide, and when thoroughly digested and understood, will serve as an intelligent starting point for a dyer to proceed with the work, and in no other class of dyeing is this more apparent than in dyeing hosiery.

The following details for fast black dyeing with aniline oil and aniline salt are known to have been the actual working formula in a dyehouse in Germany, which was noted for the excellence of its output. It is not known at this time whether this particular dyehouse is in operation, but the probability is that it is idle.

Preparation of Goods

Careful preparation of the stockings to be dyed is one of the most important preliminary operations, since, without some sort of treatment of the materials to be dyed before actual entry into the dye baths, there is every possibility that the shade will not be even, or the color not fast, and fastness is the crucial test for aniline blacks.

The stockings are boiled in a sufficient volume, usually 300 gallons of water for each 100 lb. of hosiery. In this water is dissolved 5 lb. of soda ash. Boiling continues for one to one and a half hours. This alkaline boil dissolves and removes oils, and other fatty or waxy substances always present in the cotton. The goods are afterwards rinsed in two changes of clear water to remove the excess of soda, and then immersed in a tub of acidified water containing about 1½ gallons of acetic acid for 100 lb. of stockings. The temperature of this latter bath is maintained at a moderate degree, say, a good hand heat. The object of this treatment is to neutralize all the soda that is mechanically held by the cotton. From this weak acetic acid bath, the stockings are lifted and thrown on to a grill and allowed to drain for some time, and then they are whizzed, and hung until dry in a dryroom at a temperature of 130 deg. F., which usually requires overnight.

Preparing the Solution

The dyeing is carried out in several stages. There is first prepared the aniline oil mixture, consisting of 40 lb. of aniline oil dissolved with 40 lb. of hydrochloric acid, standing at 28 deg. Tw., and thoroughly mixed together in a large stoneware crock. The temperature rises rapidly during the mixing, but it is stirred from time to time until it has dropped to about 70 deg. F.

In the meantime, there has been prepared separately a solution of 40 lb. aniline salt dissolved in 18 to 20 gallons of water. When both solutions are about the same temperature, they are mixed and well stirred. To this solution there is added one made with 40 lb. of chlorate of soda in 16 gallons water. This makes the stock solution for the actual dyeing.

The oxidizing solution, which is prepared with some degree of accuracy, consists of 12¾ lb. of clean, bright bluestone; 10½ ounces of bichromate of potash, and 1½ lb. of oil of vitriol which has been previously diluted with water to stand at 6 deg. Tw.

The Dyeing Plant

The impregnating or saturating of the stockings is carried out in large wooden troughs, into each of which is placed the mixed solution of aniline, etc., diluted with water to stand at 12 deg. Tw., and ½ gallon of the chrome-copper solution; the whole being well mixed.

The impregnating troughs used are built similar to bath tubs, but without a sloping end, they have, however, a semi-cylindrical bottom, which permits the stockings to be better poled than if the bottom is flat. The writer has seen this work done, however, in rotary dyeing machines of the ordinary type common in many American dyehouses, and with excellent results.

(Continued on page 9)

AMERICAN DYESTUFF REPORTER
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Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

MYRON DREW REESER, Managing Editor

A Suggestion Regarding Dyestuff Samples

A short time ago there was a discussion regarding the value of dye tests in general. It had been noticed that two lots of Direct Brown tested at different times differed both in shade and strength and some doubt was expressed as to whether one or the other represented the true conditions. The owner of the goods asserted that both samples came out of the same bottle so it was evident that there was a blunder somewhere.

The chemist who made the tests was questioned and was asked to make a further report. The findings showed that the brown contained Congo Red, Chrysamine and Direct Black—a very common mixture at this time. Any acid turned the Congo Red into a blue. The Chrysamine was turned orange by weak alkalies and yellow again by acids. The Black turned violet with acids and greenish with alkalies. Even the breath was able to change the shade of a fresh dyeing. The facts were demonstrated to the man who had made the complaint but he was not convinced that he had not received a fair test. Further conversation with the chemist brought out the fact that complaints of similar nature were quite common but, instead of having the trouble investigated, it was customary to question the accuracy of his work. He then showed us several samples of dyes that had been reduced from the original type. They were composed of powdered color and salt mixed with lumps of strong color and lumps of salt. He stated that when he made a test it was necessary to grind the whole sample to a uniform powder but this did not guarantee that the whole sample did not represent either an excess of strong color or salt. The sample only needed to be tapped on a table a few times when the salt would collect on top and the color would pack together at the bottom. It is easy to imagine a keg of such dye travelling on a truck over a rough road and then being sampled through a hole bored in the top or the bottom. A lawsuit might easily result by comparing the results of the two samples taken from the same package.

It was suggested that many of these misunderstandings could be avoided by selecting samples with more care. Mixtures made with sensitive or slowly exhausting colors were always a source of trouble. Very much reduced dyes would always dye uneven in light shades and the use of Acid Blacks for shading mixtures would prove a disappointment. It is always possible to force any mixture to do its best providing one knows its composition. When such a combination is tested blindly by a routine method all the defects will appear. This is really an advantage because the points that come out will be those that the dyer will object to and most people like to know beforehand what objections are likely to be made.

We noted that the task of deciding dyestuff controversies impartially was no sinecure. It is always so, even in a court of justice, for when the judge renders a decision, one party remarks "Oh admirable judge," while the other remarks "He is kept on the bench by politics." In every case there is bound to be a loser and a winner and it is doubtless very unpleasant for the one who makes the decision to hear the groans of the loser.

It has been suggested that in all cases where dyestuff controversies are to be decided by test to submit three or four samples lettered at random A, B, C, and D. This allows two of each and eliminates entirely any personal element.

When anything seems irregular it is best to have it investigated, for the very reason of the irregularity may be worth knowing.

We personally believe that every dyestuff dealer, manufacturer and consumer should have at least a small equipment for making his own tests and familiarize himself with every dye he handles. This view is shared by those who make a business of testing because they know that there will still be enough controversies to keep them busy but the work will be easier to handle when everyone knows the requirements.

Fast Black on Cotton Hosiery

(*Continued from page 7*)

The common tomtom, familiar in some localities, is also most admirably adapted for this work.

The trough (or dyeing machine) being properly filled, the dry stockings, previously weighed out in equal sized lots, are quickly immersed with the aid of the pole, and slowly moved about for about half-an-hour; longer is not necessary. Wetting out with the dye solution proceeds quickly and uniformly due to the preliminary treatment. From the trough, the stockings are taken to a draining rack overhead, and then to a whizzer, all liquors being saved and run back to the trough.

Details of Oxidation

When whizzed, the stockings are thrown out in heaps, where they are boarded carefully, and hung in the oxidizing chamber, which is kept uniformly heated to about 135 deg. F., for two hours. More rapid oxidizing-drying is found not to be advantageous; there being a possibility of incipient destruction of the cotton if too hurried oxidation is attempted.

After oxidation is completed, the stockings are removed from the boards, and then worked for about twenty minutes in a fresh bath, heated to 100 deg. F., containing from 2½ to 3 lb. of bichromate of potash in solution. This final treatment completes the oxidation commenced in the chamber, and causes the gradual development of the fast black. Indeed, this bichromte treatment may

profitably proceed at a slower rate provided the dyer is content to operate commencing at a lower temperature, say, 80 deg. F., gradually raising it to 100 deg. F.

Washing and Softening

This practically completes the dyeing. The final operation consists of a thorough washing to remove the remaining traces of salts and acids, then finishing by applying a softener of which there is none better than a first class well made olive oil soap.

Some dyers have a formula of their own for fast black softener on hosiery which they use regularly, and with good results. These men are experienced, and know how to prepare their private formulae properly, but it is almost next to useless for any one without experience, and who has large batches of dyed hosiery coming on every day, to attempt to prepare the softener himself. His best results will, in such a case, be secured by buying the finish ready compounded.

There is to-day, a firm demand for fast black stockings. Stockings that will not wash to a slate or green shade. The writer has examined a number of stockings bought in the average run of stores, and from previous experience, this weakening of the shade is due to too hurried work in the dyehouse, and with a dye mixture that was not properly balanced.

No Statement Issued by Board of Governors

There has been no authorized statement issued by the committee engaged in forming the Dyestuffs Manufacturers' Association of America.

Such a statement will be issued to the Reporter the latter part of next week.—*Editor.*

Indigo Paste

Di Brom Indigo in paste form is being offered to dealers and consumers. While this is one of the vat dyes it differs only in shade from true Indigo. There has been a demand for such a product among the makers of

ginghams and shirtings. The greatest drawback at present is the absence of solid Hydrosulphite on the market. Dyers can make their own Hydrosulphite from Sodium Bisulphite and Zinc dust but like to use the solid variety when they can get it. We await with interest the appearance of other vat dyes, especially the so-called fancy shades. It may be that Di Brom Indigo can be used in place of Indanthrene in tinting white paper. The shade is redder than Indigo and the fastness is equal to all requirements. The experiment is worth trying and there are many paper mills who have been asking for such a dye for some time.

Beam Dyeing

An Interesting New Invention

There is no standing still in any industry. The dyeing trade has been completely revolutionized every five years for the past twenty years. Perkin led the way when he showed us how to "copy nature," and all true invention is simply copying, or following nature; by restoring to us the beautiful colors nature gave us and stored away for us untold ages ago. Compact dyeing is no exception to the rule, and the dyeing trade has now for some time been much interested in following the efforts of experts to devise a successful method of Beam Dyeing. Among those who have been hard at work with this object in view must be named John, Edward and Thomas Brandwood, Managing Directors of The Elton Cop Dyeing Company, Limited, Bury, Lancashire, England, who, after continued effort since the foundation of their works in 1900 have, some little time ago, perfected a system of beam dyeing which, it is not too much to say, looks like revolutionizing the dyeing industry.

The world's population is demanding, and will demand better and faster colors in increasing variety. Not only must dyers now give all the best and fastest colors, but they must give them at the lowest possible cost, and this is why experts maintain mechanical dyeing must ultimately completely supersede the old and out-of-date methods, known as skein or chain dyeing, for not only is mechanical dyeing, in their opinion, the only possible way of getting perfect dyeing on a large scale, but it is the only one possible from an economic point of view. In beam dyeing, the liquor pump circulates the dye liquor through every particle and fibre of the yarn on the beam, and the air pump fixes the color and makes it good. The advantages of beam dyeing are held, now, to be such that it must, in time, take the place of every other way of coloring warp yarns on a large scale. John Brandwood sums up the principal advantages as follows:

1. The cost of beaming or dressing is entirely saved, which may be anything from one farthing per pound up to two pence ½s per pound, according to the quality, and counts of yarn being worked.

2. The cost of dyehouse labor is reduced to the very low rate of one-tenth of a half penny per pound where the plant can be kept running fairly continuously.

3. The production from the loom is increased about ten per cent. because all the elasticity, and the full strength of the yarn is maintained.

4. The cost of dyeing materials is reduced, especially when working with indigo, indanthrene, hydron, helindone, algole, theoindigo, ciba, and other vat dyes, or colors, which are the fastest and most expensive colors at present known.

5. There is no streaky, or uneven dyeing, perfect penetration is secured, every particle of the fibre being equally permeated and not plastered on the outside as in chain dyeing. Faster and brighter colors are secured, there is no broken, or damaged yarn, no beaming room is needed, and not more than a quarter of the dyehouse room, finally easy and reliable matchings of dyeings are obtained.

These are such manifest advantages that the new method calls for the closest investigation, and consideration from dyers generally. Further, no drying cans are required, and a considerable saving in steam, water and power is effected, but there are certain essential requirements in a beam dyeing plant if it is to accomplish the above much-desired results. These may be said to be:

1. It must dye the whole set of beams of one color at one operation. For example, in a case in which, say, six beams of indigo blue are needed for a set of denims, or chambrays, the whole six beams must be dyed together at one operation, and the color must be even, and fast, that is perfect.

2. They must be equally suitable for all descriptions of colors, so that the same plant, with a modification of treatment, will dye equally well all classes of colors, whether vat colors, azolized, and developed colors, sulphur colors, or substantive colors, and dye each description of colors as economically as possible.

3. It must use a section beam of the usual size that will hold 300 pounds of yarn, and can be run in the warper, the dyeing apparatus, and in the slashing frame without trouble, and one that will last indefinitely.

These conditions fulfilled, it may be said, without hesitation, that the final problem has been successfully solved in dyeing warp yarns on a large scale, and that every manufacturer of colored goods on a large scale will before long have to adopt it, or retire from business. Beam dyeing is of no value to the manufacturer who uses little colored, and a great variety of colors in the manufacture of his goods. Take, for instance, a manufacturer of high-class shirtings. He will use a hundred colored ends maybe altogether and several colors in a piece of cloth. Beam dyeing is of no service to him for he could not use a beam, or even half a beam of one color in any cloth he makes. Here beam dyeing is obviously not suitable, or economical, but even he cannot go on in the old way. The course for him to adopt is to dye in a smaller way than the beam, that is in the cheese, or spool, and this course must recommend itself to him.

Cheese dyeing offers sound advantages in economy of production, which make it a good business proposition. In carrying it out it is the practice to put the cheeses, or spools behind the slashing frame, and run along with the beams of gray yarn, and in this manner the unnecessary labor in beaming is cut out. There is, however, it must be pointed out, nothing like the saving effected as in beam dyeing for the cost of manipulation in dye house labor, dye materials, and steam is practically as great as in chain dyeing. Still the beaming is eliminated, which makes it the most economical manner of producing goods of this kind in which only a small minority of threads are colored.

The colored goods manufacturer who reads this article will want to know if it is possible, and practicable for the three essential requirements, just given, to be embodied in any beam dyeing plant, or apparatus, and if so, is such a plant already in existence. A plant of this kind has been at work in the United States, and Canada, now, for some time dyeing and bleaching over a quarter of a million pounds weekly, and reaping all the advantages already mentioned, and a plant is being installed for a further half million pounds weekly. Such being the case, every colored manufacturer will be only too pleased to have some little guidance as to what are the essential features in mechanical construction of such plant, and apparatus, and how such results are accomplished. It is claimed that the Brandwood system of Beam Dyeing is the only system possible by which the aforementioned results can be obtained because it combines the three essential principles necessary to secure perfect and satisfactory results:

The first essential principle is means for controlling the density, or hardness, of the beams. Every practical dyer knows how different qualities of yarn behave differently in the same dye bath, and how, also, different dyestuffs behave differently towards the same class of yarns. This knowledge can only be acquired by practical experience, and is not to be found in books. This is why it is easy to make beams so hard, or so soft, that it is impossible to dye same satisfactorily by any mechanical means. By the Brandwood system, it is possible to control the density or hardness of the beams at will by means of a simple and effective apparatus which can be attached to any warper. These attachments are made in the United States for the patentee under License by the Draper Corporation, Hopedale, Mass., to whom they have granted a Sole License in the United States for the manufacture of the same. This Density Controlling Apparatus can be fitted on to any make of warper.

Attempts have been made to accomplish the same results by partially collapsing the dyeing cylinder while the yarn is in process of dyeing, but all such attempts must necessarily be very poor makeshifts, indeed, compared with the Brandwood method of accomplishing this, and such methods mean a dyeing cylinder that is huge and cumbersome, also impracticable. Their dyeing cylinder is only the size

and weight of an ordinary wood section beam, is equally suitable, alike, for the warping machine, the dyeing machine, and the slashing machine, and lasts a lifetime.

The second essential principle is that the beams must be dyed in the vertical position, in a closed chamber, at greater than atmospheric pressure. In no other way can uniform and satisfactory results be secured. Messrs. Brandwoods began many years ago by dyeing in a horizontal position, and followed this up by rotating the beams during the dyeing process. It was no use, and they were at last forced to recognize the inevitable, that no two things can occupy the same space at the same time, and nature makes no exceptions. A beam of yarn, no matter how lightly wound, is just as full of air as the atmosphere itself. It must, of course, be obvious that until all the air is removed it is impossible to impregnate the yarn evenly with dye liquor, and in attempting to dye in the horizontal position the upper part of the beam always forms a series of natural air pockets which it is impossible wholly to get rid of by any mechanical means. For this and other reasons, all attempts at dyeing beams in the horizontal position are foredoomed to failure. Further, dyeing in the vertical position enables any number of beams to be dyed together at one operation, renders mechanical means possible for quickly and automatically pulling the beams in position in the dyeing chamber, and just as quickly removing the same. A six beam dyeing chamber can be charged, or emptied in about five minutes. The above principle of dyeing beams in a vertical position (and the principle is a most important factor in obtaining successful results), in a closed chamber, and at greater than atmospheric pressure, together with the means of carrying the same into effect is Messrs. Brandwoods' invention, and is patented in the United States, and all industrial countries so that there is no possible way of dyeing a beam, or a whole set of beams at one operation evenly and uniformly throughout without the use of these patents.

The third essential principle is the fixing or developing of the color after dyeing by the application of air pressure from the outside to the inside of the beam. In the first plants Messrs. Brandwoods had working, vacuum was utilized, but even a perfect vacuum, if it could be obtained, is altogether inadequate for this purpose. Then they applied air pressure up the centre of the beam, which was found to be little better because the effective pressure

was lost in its radiation outwards, and so the color was only partially fixed, the dyeing uneven, and a large quantity of dye liquor remained in the beam.

Their system is unique in that the air pressure is applied to the outside of the beam, and so the mean effective pressure is maintained all the way through the beam, and further, the whole set of beams are oxidized together at one operation, and all the moisture removed that is possible by mechanical means. This principle they have patented in the United States and all industrial countries, and it is the only sure method achieving perfect results, as well as being by far the most economical way. The color is therefore not only fixed and developed on the whole set of beams simultaneously, but the great bulk of the moisture removed, so that there is no need to dry them further before slashing, and if the beams are allowed to lie in the slashing room a few weeks before slashing, they will take no harm, but will just dry out naturally.

The dyeing cylinder is constructed in an ingenious manner, making it equally adaptable to the warper, the dyeing apparatus, and the slashing frame. It is made from metals that are in no wise affected by any chemical or dye liquors used in a dye house. It is no heavier or bulkier than an ordinary wood section beam. It holds 300 pounds of yarn and cannot get damaged by rough handling. It lasts a lifetime. This dyeing cylinder is filled in the ordinary way in the warper, but on the warper there is a simple but reliable attachment which enables the beam to be wound to any degree of hardness or density required for dyeing, for in beam dyeing as in any other method of dyeing, different qualities of cotton behave differently in the dye bath, and also different colors require different treatment. Hence the need for controlling the hardness or density of the beam. The attachment mentioned not only controls the density, but ensures its being uniform throughout the beam, so essential in beam dyeing. It is a single roller, covered with special material, which assists the yarn on its warp on to the beam by traveling at a greater surface speed than the yarn itself, or retards the yarn by traveling at a slower surface speed, as may be required. An arrangement of levers and clutch ensures the roller being out of action just before the beam stops and until just after it starts up. The speed of the roller can be readily adjusted. It is impossible to imagine any other way of accomplishing this object.

The dyeing apparatus itself is unique in that it may be constructed to dye any number of beams, the general rule being to dye the full number of beams or each set at one operation. The beams all automatically find their positions in the dyeing chamber, and are not taken out until they are finished and ready to go to the slasher. The dyeing is, of course, done in the vertical position in a closed chamber under pressure greater than that of the atmosphere and the apparatus can be immediately adapted so as to dye indigo, indanthrene, or any of the vat colors, azo, developed, and sulphur colors under the conditions most suitable for each dyestuff.

The deadlock in trying to dye beams in the horizontal position is that air pockets will form in the upper part of the beam and cannot be gotten rid of. If the beam is rotated during the dyeing operation, the air pockets just stay there and the result is patchy, spotted, and uneven dyeing. The space required when the dyeing is done in the vertical position is not one quarter of the space required for a chain dyeing plant of a similar capacity.

(*Continued in next issue*)

Brander, Bergstrom & Co., exporters and importers of chemicals from Buenos Aires, have recently opened a branch office at 141 Broadway, New York City.

Application has been filed by the Day Chemical Company, Chicago, for incorporation. The incorporators are James B. Day, Robert A. Heveenor, R. H. Clinton, Hilgard B. Young, and Ernest T. Stelle.

AMERICAN
DYESTUFF REPORTER

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Inventiveness Needed in the Dyestuff Industry

ALL of the human attainments that are really worth considering, in this world, have been produced by minds that disdained to take the path of least resistance. Nature, on the contrary, progresses by taking the easiest and least resisting course, produces an abundance of all varieties and allows a great percentage to be eliminated in the struggle for existence. The results is that nature's productions having been sorted out by the ordeal of the survival of the fittest, are efficient, but the cost of production is beyond calculation. The natural processes moreover are slow and far overstep the cycle of man. We may deduce therefore that a natural growth is not a method adaptable to man's achievements.

The temptation to take the easiest path is great, and many take it, not counting on the devious turnings and detours that lie between start and goal. Precedent is venerated in this world but precedent is the arch enemy of originality.

How many people, taking a tour over our many highways, stop to think what chain of circumstances control the direction of their journey? One day, in the earliest time of animal life on the continent, some wild beast journeying about for food and drink, crashed its way through the tangle forcing a passage where none had been before. Later other beasts, finding an opening already made, took this path of least resistance and by degrees the vegetation was destroyed and a trail was established. When primitive man came on the scene he only followed the natural course and adopted for his own the the same beaten path. Centuries passed and the trail became a road, then a highway. It is now too late to straighten its turns and it will remain a monument to a strictly primitive tendency that still remains a dominant force among the most highly developed of animal life.

While the matter of roads serves only as an illustration of a trait or tendency we may carry an investigation further and note how our daily life is made to conform to precedent, habit and the travel of the beaten path.

It is useless to attempt to overthrow the traditions of society, and in fact little good would be accomplished. In business and science however the natural method of development has no place whatever. Here the rule should always be—"a straight line is the shortest distance between two points." The rule is crude and blunt in its expression and is often toned down in order to better please the ear. All suggestions as to 100 per cent efficiency in business are but variations of this fundamental theme. The application of the rule involves the removal of all obstacles that may intervene between the point of

starting and the finish. This not only means there must be no detours, but all grades must be abolished, so a straight, level road remains.

The man who accomplishes this and attains an ideal without following the winding, beaten path of precedent may be called original, a genius or eccentric, but in fact it matters little what he is called if he accomplishes his purpose.

This would be a good place to explain that this article was not cut from a popular magazine merely to fill space, but was written with a hope that it would be read by most of the manufacturers, dealers and users of American dyestuffs. If there ever was a need to discard precedent and leave the old "Made in Germany" highway it is now. Our smaller factories are worrying along with processes that had been abandoned years ago and the output of dyes is mainly determined by the offerings of intermediates on the open market. This will get us nowhere. We must have a clear level road if we are to hold out, and later we can establish new roads through the wide unexplored territory. Our largest American factories have equipped research departments where it is hoped that new straight lines will be mapped out. Another large silk dyer has abandoned the road of least resistance and has driven several straight lines through almost insurmountable difficulties and obtained many valuable dyes. Other plants have been working assiduously and making their objective the first consideration, these will succeed. Others however have but one aim, to make as much money as they can at present, without helping the nation at large or laying a formation for their own future existence.

Just as the army in the field needs the co-operation of all the productive forces of the country so the dyestuff industry needs assistance from others. Our colleges must train men for this work and our economic system must recognize the value of the industry. Our legislation must not all be for the poor farmer but must be made equitable and the tariff and patent laws adjusted to meet the new condition. There should be no lack of capital where there is an earnest effort to develop along the right lines and it might even be possible to make the production of dyes a co-operative scheme among the consumers.

Practically all the great synthetic drugs that are now used so extensively have had their development in dyestuff factories. America has initiative and should not be compelled to follow beaten paths. We can do all these things right here if the sentiment of the country supports the effort.

The consumers of dyes are asked to inform themselves correctly and do everything in their power to correct the public impression that dye manufacture is essentially a German industry.

As a fact the industry is more English than German, but on account of the short-sighted legislators in England they allowed the supremecy to be stolen from them. Shall we allow Congress to do the same for us?

The Cooks Falls Dye Works, New York City, has been incorporated with a capital of $30,000.00.

Why Do You Not Issue a Press Bulletin ?

There is a certain manufacturer of dyestuffs who sends out each week a series of bulletins announcing new developments in his plant. This is a particularly good idea and one of great importance in proper consumer education. Why then are not the same bulletins prepared by other American manufacturers?

The press will gladly reproduce articles relative to the industry and the information would be more authentic than that which is now obtained through the customary channels of journalism.

This industry needs proper publicity. Don't blame a trade-paper for reproducing an article that does not suit you. Remember that a trade-paper wields a vital influence in this new industry. The AMERICAN DYESTUFF REPORTER wants to cooperate with you for the good of the industry, so send us the proper information regarding development in your own plant.

Editor.

INQUIRY DEPARTMENT

AMERICAN DYESTUFF REPORTER:

Please explain fully the difference between a blue black and a jet black and where is each most useful?

While this question is similar to one answered recently it may be advisable to go into more detail. A blue black or a black blue is a dye with a blue tone but still enough of the black element in its make-up to give the appearance of a deep black in heavy shades. The blue element is most in evidence when the dyed material is viewed parallel to its surface and is called "over-tone." A jet black is generally made from a blue black by the addition of yellow, orange or scarlet which causes the blue element to be destroyed so that the black alone is effective. A true jet black is not often seen, but generally commercial dyes retain some of the blue effect. A jet black has an undesirable overtone and is termed "rusty" or "slaty."

The jet black is more economical because a quantity of a blue black that would only make a deep blue may be changed into a full black by the addition of orange. Whether yellow, orange or scarlet is to be added depends on the tone of the blue black. It is considered a fatal defect to turn the black into a reddish tone because a red overtone is displeasing. The rule of using one or the other is dependent on whether the overtone plays any part or not. Piece goods generally require a full shade of blue black although men's suitings may be almost jet. Where black is to be mixed with white, either in stock or yarn, it is advisable to use a jet black for economy's sake. It is difficult to judge the relative value of two shades of black, but when necessary to do so the blue shade should be made into a jet by addition of other colors and the total cost computed in comparison with the other.

AMERICAN DYESTUFF REPORTER:

Is there anything that will prevent a dyeing from crocking? The goods have already been dyed so it is too late to make any corrections in the dyebath.

It has been found that a thin paste of Gum Tragacanth dried into textile fabrics has no stiffening effect but will prevent the color from rubbing off. The effect is purely mechanical, not chemical. Each fibre becomes coated with a thin film of protective material and any loose particles of dyestuff are held firmly. The great bulk of water held by the gum causes it to dry down to a very fine, tough film that coats the fibres but is not bulky enough to connect them. Starch and glue would have too much filling effect and would cause stiffness.

AMERICAN DYESTUFF REPORTER:

Has mercerized cotton any other effect on dyestuffs than the brilliancy due to the fibre?

Dyers of mercerized cotton notice that the dyebaths exhaust more quickly and completely than in the case of ordinary cotton. It is also noticeable that dyeings of Benzo Purpurine are less likely to turn dark and that many pale blues gradually fade. There seems to be a more intimate union of dye and fibre and although the cotton may show a neutral reaction it appears to exert the same influence as a mild alkali. Inequalities of mercerization will also cause uneven dyeings that are amost impossible to control.

AMERICAN DYESTUFF REPORTER:

How can Direct Blacks be made fast to washing and how do they compare to Sulphur Blacks?

To have a Direct Black fast to washing it must not be dyed in a standing bath but must have a fresh bath each time. There is a small amount of material which accumulates in the standing kettle and which does not fasten properly and also prevents the true dyestuff from being taken up to the best advantage. It is also well to add about 2 per cent of Soda Ash to the dyebath and not to use more than 20 per cent of Salt. After an hour's boiling the rinsing must be thorough in order to remove all loose color. The dyeing is usually fixed in a fresh bath containing one-half per cent. of Bichromate of Soda and 2 per cent. of 40 per cent. Formaldehyde for 20 minutes at 180° F. Some dyers even boil in the fixing bath, but as the black becomes redder it is necessary to soap it to restore the shade.

The fastness of Direct Black treated in this way is sufficient for hosiery and has been used on loose cotton for mixture in cheap woolen goods without staining white stock in a light fulling. Sulphur Black, however, is very much faster, both to washing and light and is not so likely to turn reddish. Of course the Direct Blacks can be applied to mixed goods while Sulphur Black is only used for cotton.

The Monsanto Chemical Co., St. Louis, Mo., has recently acquired the property of the Commercial Acid Co., E. St. Louis, Ill., for an amount which is said to be something in excess of $2,000,000.00. The plant consists of twenty-five factory buildings with full equipment that will be used for the manufacture of sulphuric acid, nitric acid, etc.

NOTES OF THE TRADE

The ballot from the annual election of the Chemists' Club, New York, has been prepared and is as follows: Ellwood Hendrick, for president; Charles L. Herty, first vice-president; Victor G. Bloede, C. L. Parsons, second vice-presidents; J. R. M. Klotz, secretary; Henry M. Toch, treasurer; K. G. Mackenzie, Jerome Alexander, T. R. Duggan, trustees to be elected.

A new dyestuff manufacturing plant to be known as the Colonial Aniline Works has recently been established at Monticello, N. Y. It is incorporated with a capital of $10,000.00 by W. Lowenthal, C. Lowenthal and P. S. Glickstein.

A part of the Picric Acid Plant of the Butterworth Judson Corporation, Newark, N. J., was damaged by fire on Sunday, March 24th. It is estimated that the loss will exceed $100,000.00.

We have received information from the Federal Dyestuff & Chemical Company of an offer of $3,100,000.00 made to them by the DuPont interests for their plant in Knoxville, Tenn.

The Lippincott Chemical Co., of New York City has purchased a factory in Orange, N. J., for the manufacture of dyestuffs and chemical products.

The Tennessee Copper Co., 11 Broadway, New York, is contemplating plans for the increase of its output of sulphuric acid. This product is at present being made at Ducktown, Tenn., and the necessary addition in plant equipment will enable them to produce approximately 3,000,000 tons annually.

The Manhattan Dye Works, 856 Manhattan Ave., Brooklyn, N. Y., are contemplating the erection of an addition to their plant which will cost approximately $50,000.00. This plant will be located on Green Street and will consist of a two-story brick building about 100x150 feet.

The Robax Chemical Co., has been incorporated under the laws of Delaware, with a capital of $100,000, by C. A. Cole, Hackensack, N. J.; A. R. Oakley, Pearl River, N. Y.; P. E. Britsch, Brooklyn.

The Bond Chemical Co., Camden, N. J., has been incorporated by Joseph Mallon, John J. Finney and Frederick M. Wick, all of Camden. The capital is $125,000.

J. F. Linberg, E. J. Linberg and J. F. Linberg, Jamestown, N. Y., have incorporated the dye and chemical firm of J. F. Linberg Co. Capital is $50,000.

Ault & Wiborg Co., Cincinnati, has increased its capital stock from $2,000,000 to $10,000,000, and is to materially enlarge its production of chemicals and coal tar dyes.

Licenses are Issued for American Firms to Use Dyestuff Patents

After months of experimenting with six hundred German patents for manufacturing dyestuffs, the proper combinations of the patents for commercial production of dyes has been determined and the Federal Trade Commission has issued thirty licenses for use of these patents under the trading with the enemy act. Twenty-two applications of the E. I. Du Pont de Nemours Company, of Wilmington, Del., and eight applications of the National Aniline and Chemical Company, of Buffalo, N. Y., have been granted.

The Lloyd Chemical Works, Belleville, N. J., is negotiating for the purchase of the property formerly occupied by the Kent Motors Corporation, Belleville, about 16 acres. It is planned to construct a large new chemical manufacturing plant comprising several threestory structures for initial operations, and it is said that the entire project will involve an expenditure of about $2,000,000.00. The company has been awarded a large contract by the Government for the manufacture of chemicals.

The Crescent Color Co., West Front St., Plainfield, N. J., has recently begun the construction of an addition to its plant which it is estimated will cost about $20,000.00

The Noequa Chemical Co., Philadelphia, Pa., which was recently incorporated with a capital of $450,000.00 is planning for the erection of a new manufacturing plant which will be located at Rittersville, Pa.

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MYRON DREW REESER, Managing Editor

What the Consumer Thinks

We have always contended that the consumers of dyestuffs have not been consulted enough regarding matters of importance to the future of the dyestuff industry in America. It must be remembered that it is upon the action of the consumer that the industry is to prosper, consequently his favorable opinion should be sought after.

Some time ago, we sent out a questionnaire to a number of mills throughout the country asking them for a statement of their opinion as to what would be the proper amount of tariff protection necessary to foster the industry. There were a thousand letters sent out and over sixty per cent of them returned to this office, showed that the consumer was more than interested in having the American industry protected. This information should be of value to the manufacturers as well as to the Government, and with this in view we are reproducing the name of the company and their statement regarding the subject.

Sunset Woolen Mills, Bandon, Oregon:
"Advocate a protective tariff to be guaranteed for at least twenty years, in order to encourage those who are willing to spend money to develop the industry in the United States and high enough to keep out all others."

Riverside & Dan River Cotton Mills, Danville, Virginia:
"I think it fair to advocate a reasonable rate to give necessary protection on such articles as could not otherwise be made in competition with Germany, but on nothing else."

Lincoln Woolen Co., Camden, Maine:
"Strong protective tariff."

Dill & Collins Company, Philadelphia, Pa.:
"High tariff for a period of two years."

The Glazier Mfg. Co., South Glastonbury, Conn.:
"Adequate protection for the American industry."

Byron Weston Co., Dalton, Mass.:
"Protection enough to insure American production."

Conic Mfg. Co., Conic, N. H.:
"A reasonale tariff to protect American manufacturers, provided the dyes are sold as low as the foreign made dyes."

S. Slater & Sons, Webster, Mass.:
"The judgment of the writer is that a protective tariff should be advocated on American made dyes, which means, of course, that it would be a tax on the whole country indirectly, for the reason that well-established dye industries have the elements around which high explosive manufacturing can be carried on in case of sudden need. That is a Government asset which should be protected and developed."

St. Cloud Woolen Mills, St. Cloud, Minn.:
"Sufficient protection only."

Hampshire Paper Co., South Hadley Falls, Mass.:
"A sufficient protective tariff, not monopolistic."

Pacific Mills, Lawrence, Mass.:
"Equal protection for all classes of dyestuffs."

Arlington Mills, Lawrence, Mass.:
"Sufficient protection to insure continuance of American manufacture."

Richardson Silk Co., Belding, Mich.:
"We advocate a very high tariff."

Belding Brothers & Co., Northampton, Mass.:
"It is our belief that a rational protection should be given."

Windham Mfg. Co., South Windham, Maine.:
"Go gunning for prohibitive embargo until such time as the American industry is on its feet. Also a working clause in our patent laws that will insure all steps of manufacture being conducted on American soil."

Mead Pulp & Paper Co., Chillothe, O.:
"American manufacture manufacturer of dyes should in our opinion be encouraged and fostered."

Marathon Paper Mills Co., Rothschild, Wis.:
"We believe in a protection of American dyestuff manufacturers."

Belding Brothers & Co., Petaluma, Cal.:
"Sufficient protection to insure home production."

Muskegon Knitting Mills, Muskegon, Mich.:
"We believe that a strong protective tariff should be imposed."

Gilbert Paper Co., Kenosha, Wis.:
"In our opinion there should be a protective tariff."

Caraleigh Mills, Raleigh, N. C.:
"A protective tariff so as not to make the mill manufacturer pay too much for his dyestuffs. We might also advocate a cooperative tariff."

Sawyer Tanning Co., Napa, Cal.:
"Only a study of the industry can determine how much tariff to impose. We believe it should protect American manufacturers."

Otto & Otto Felt Co., Belvidere, N. J.:
"We believe the Government should protect American dyestuff manufacturers."

Skyland Hosiery Co., East Flat Rock, N. C.:
"Enough to offset difference in labor cost here and abroad."

Columbian Paper Co., Buena Vista, Va.:
"There is a very wide difference of opinion on the tariff as you well know, and any view you may have on the subject will no doubt be influenced by your general views on a protective tariff issue."

Glenlyon Dye Works, Central Falls, R. I.:
"A reasonable tariff thirty to forty per cent enough to encourage the manufacturer of the high class dyestuffs which are not yet being manufactured."

Clinton Woolen Manufacturing Co., Clinton, Mich.:
"There should be a protective tariff on synthetic dyes, higher than on natural or wood dyes."

(Continued on page 10)

Fast Black on Cotton Hosiery

(Continued from last week)

Another unique feature of this system is the oxidizing. As is well-known, all the best and fastest colors are colors of what are known as the vat colors, such as indigo, indanthrene, etc., and all such colors must be oxidized or fixed on the yarn by means of oxygen of air. In the earlier attempts vacuum was utilized, but even a perfect vaccum, if it could be gotten, is not powerful enough for this purpose. Then air pressure was applied up the centre of the beam and was found to be little better for the effective pressure was lost in its radiation outwards, and so the color was only partially fixed, and was uneven. This system is unique in that the air pressure is applied on the outside of the beam and so the mean effective pressure is maintained all the way through the beam, and the whole set of beams are oxidized together at one operation. It is by far the most economical system. On this apparatus raw stock can be dyed just as easy and straightforward as beams on the same plant, and thus, for the first time, raw stock can be dyed indigo and other oxidation colors perfectly fast and even, so that it will spin just as well as gray cotton. There is no matting nor shortening of the staple. The cotton is not made harsh or rough in the dyeing. The cotton is automatically filled in the cylinders which automatically empty themselves, and no hydro extracting is required as is the case in all other systems for raw stock dyeing. The plant is also just as suitable for bleaching as for dyeing. The beam dyed yarn can be quilled and a greater production ensured than by quilling from the chain.

By no means an unimportant feature is the simplicity and reliability of matching the dyeings and the ease and regularity with which one batch of beams after another can be matched off. When it is realized that here is dyeing being conducted, at last, on a scientific basis with the weight of yarn, weight of color, volume of liquor, and time of operation, all under easy, and absolute control, it is easy to see that matching is simple and results are sure.

Eureka Silk Dyeing Co., Paterson, N. J.:
"Enough tariff to cover the various differences."

Fred. Strauss Dye Works, Chicago, Ill.:
"American made dyes must be protected by tariff."

Gardiner Hall, Jr., Co., South Wellington, Conn.:
"We are to advocate tariff high enough to protect the American manufacturers of dyestuffs."

McCallum Hosiery Co., Northampton, Mass.:
"The manufacturers of dyestuffs are the proper parties to decide this important question."

Pennsylvania Silk Dyeing & Finishing Co., Frankford, Pa.:
"A commission should be appointed formed of dyestuff manufacturers and users of same to investigate the cost of production here, then fix a tariff for protection only."

Cheney Brothers, South Manchester, Conn.:
"A protective tariff so that all dyes formerly imported from Germany can be made here at a profit to domestic manufacturers."

Whiting Paper Co., Holyoke, Mass.:
"Tariffs should be such that an American industry can be built up."

Gotham Silk Hosiery Co., Inc., New York City:
"We believe in a protective tariff."

Cleveland Worsted Mills Co., Jamestown, N. Y.:
"Tariff on lines proposed by such people as Dr. William Beckers of the National Aniline Chemical Company should be enacted."

Megorgee Paper Mills, Modena, Chester Co., Pa.:
"Protect American goods so long as the quality is up to standard."

Oriental Silk Printing Co., Haledon, N. J.:
"Sufficient protection to prevent foreign competition."

Belveridge Paper Co., Indianapolis, Ind.:
"A tariff that will protect the American manufacturer of dyestuffs."

The Champion Coated Paper Co., Hamilton, Ohio:
"Sufficient tariff to really protect."

Oxford Paper Co., Rumford, Me.:
"A tariff sufficient to foster the growth of a national dye industry."

Chemical Paper Mfg. Co., Holyoke, Mass.:
"The industry should be protected sufficiently to attract capital and keep it engaged as against foreign competition."

Valley Woolen Mill, Cherry Valley, Mass.:
"We believe in a protective tariff."

Delaine Mills, Inc., Manayunk, Phila., Pa.:
"Sufficient protection to really protect."

Agawan Co., Agawan, Mass.:
"Sufficient tariff to establish the industry in this country."

Reed City Woolen Mills, Reed City. Mich.:
"Moderate, high enough to protect American-made dyes but not prohibitive to importation."

Cooper, Mills & Co., St. Joseph, Mich.:
"We advocate and favor increased duties."

Burdeen Paper Co., Otsego, Mich.:
"The American dyestuff industry should be protected."

Lee Paper Co., Vicksburg, Miss.:
"We believe a protective tariff is necessary in order to build up and maintain the industry."

The Crystal Paper Co., Middletown, Ohio:
"Enough protection to insure good dyes being made in this country."

Beckett Paper Co., Hamilton, Ohio:
"I believe in a protective tariff to cover difference in cost of manufacture."

McDowell Paper Mills, Manayunk, Phila., Pa.:
"Sufficient protection to enable the American manufacturer to make a reasonable profit."

Attleboro Braiding Co., S. Attleboro, Mass.:
"We think a high protective tariff necessary on American made dyes."

York Haven Paper Co., York Haven, Pa.:
"High protective tariff so as to protect American manufacturers when this war is over from the country being flooded with German dyes."

Fred. Pearson & Co., Inc., Phila., Pa.:
"Do unto others as you would have them do unto you."

Standard Paper Mfg. Co., Richmond, Va.:
"We advocate a fairly protective duty."

Homestead Woolen Mills, West Swanzey, N. H.:
"We think there should be a protective duty on American-made dyes."

American Novelty Printing & Embossing Works, Hoboken, N. J.:
"Sufficiently high tariff to insure protection."

The S. Y. Beach Paper Co., Seymour, Conn.:
"We advocate a duty of at least thirty per cent."

Cocheco Woolen Mfg. Co., E. Rochester, N. H.:
"We advocate a tariff necessary to protect American-made dyes."

Ford Silk Hosiery Dyeing Co., Phila., Pa.:
"A tariff to equalize domestic production."

John Gay's Sons, Inc., Phila., Pa.:
"A protective tariff by all means, otherwise American industry built up since the war will be killed."

Nye & Wait Kihnamock Corp., Auburn, N. Y.:
"We think the Government should protect the American manufacturer."

Tilton Mill, Tilton, N. H.:
"A tariff should be enough to protect."

Geo. W. Lefferts & Co., Inc., Phila., Pa.:
"Protective tariff—manufacturers of dyestuffs should know the percentage."

Globe Silk Works, New Haven, Conn.:
"Enough tariff to protect the new industries that have started up."

Warren Mfg. Co., Riegelsville, N. J.:
"A tariff high enough to protect industry and insure a home supply."

(*Continued in next issue*)

SEIZE WOOLEN MILLS OWNED BY GERMANS

GREAT PLANTS IN NEW JERSEY, VALUED AT $70,000,000, TAKEN BY ALIEN PROPERTY CUSTODIAN

Larger Concerns Subject of Investigation on Complaint of Textile Alliance

SIX great German-owned New Jersey woolen mills, valued at more than $70,000,000, have been taken over by the Alien Property Custodian, who has named governing boards to assume control of them. The earnings of the properties during the war will go into the Federal Treasury for the purchase of Liberty bonds.

The mills taken over, as announced to-night by A. Mitchell Palmer, Alien Property Custodian, were the Passaic Worsted Spinning Mills, the Botany Worsted Mills, the New Jersey Worsted Spinning Company, the Forstmann & Huffman Company, and the Gera Mills, all of Passaic, and the Garfield Worsted Mills of Garfield, N. J.

Two of the largest woolen concerns in New Jersey, both in Passaic, and both owning one or more subsidiary companies, have been under investigation in this city for several weeks by Attorney General Merton E. Lewis of New York, who instituted the investigations at the instance of the Textile Alliance of America, the great trade organization which is now the official representative of both the American and British Governments in matters pertaining to the import and export of wool. A. Mansfield Patterson is the President of the Textile Alliance and has appeared as the complainant at all of the hearings which have been conducted by Attorney General Lewis.

The two mills, the owners of which are charged by the Textile Alliance with having acted as agents of German interests in the procurement of wool, a great deal of it from British colonies, are the Botany and the Forstmann & Huffman, both among the largest producers of woolens in the United States. The Textile Alliance charges that these mills took membership in the alliance and subsequently violated the agreement by acting as agents for Germans.

Botany Mills

The Botany Mills, it is charged, are largely owned by what is known as the Stoehr interests of Leipsic, Germany. Max Stoehr, a German-born American citizen, is secretary of the Botany Mills, which company is capitalized at $3,000,000. Otto Kuhn, another German-born citizen, is the woolen manager of the concern, while Thomas Prehn, the President, is also a native of Germany but an American citizen.

The representative of the German interests, one of which, according to the Attorney General, was the German Government itself, who negotiated with the German controlled firms in this country to procure wool for use in Germany, was Hugo Schmidt, the agent in New York of the Deutsche Bank. Hugo Schmidt, who, when at liberty, made the recently closed German Club his home, is now

in a Georgia internment camp. Letters which passed between Schmidt and the owners of the mills were features of the public hearings held by Attorney General Lewis. A German named Schwerdt, who was a naturalized Belgian citizen, and who was recently arrested by agents of the Government, also had a prominent part in the efforts made to secure wool for Germany. Schwerdt got his young son released from the Belgian Army by a personal appeal to King Albert, who was Schwerdt's friend and who thought the naturalized German was a loyal Belgian subject. Schwerdt subsequently sent his son to South America as a German agent.

Forstmann & Huffman

As for the Forstmann & Huffman Company, it has for years been one of the leading industrial concerns of Passaic. Julius Forstmann, a naturalized American citizen, is the President. Forstmann maintained at the hearing that he never intended to violate any American law and that he ceased to have anything to do with the Germans after they sunk the Lusitania. He gave $1,000 to the Lusitania relief fund. Many letters which passed between Forstmann and Hugo Schmidt were introduced by Deputy Attorney General Becker in the course of the examination into the activities of the Forstmann & Huffman Company.

Forstmann is to appear before the Attorney General next Tuesday afternoon, having received the privilege of making certain statements in his own behalf. Whether the action of Mr. Palmer in taking over the Forstmann & Huffmann Mills will render this hearing unnecessary the Attorney General was unable to say last night. Forstmann was to have appeared yesterday afternoon but asked for a postponement.

Garfield Worsted Mills

The Garfield Worsted Mills was incorporated in New Jersey, for the manufacture of worsted dress goods, in 1902. The mills are equipped with 1,000 wide looms. The assets of the company in 1917, according to Poor's Manual of Industrials, were $6,003,080, an increase of nearly $2,000,000 since the beginning of the war in 1914. Theodore H. Lamprecht is the President; Anton Schmid, Vice-President and Treasurer, and W. H. Heyne, Secretary. The Directors are, in addition to the above officers, Carl Schneider, G. H. Schwab, W. Graupner, A. Hill, W. M. Kennard, and J. H. Love.

New Jersey Worsted Spinning Co.

The New Jersey Worsted Spinning Company has outstanding common stock valued at $2,000,000, according to Poor's Manual. Its offices are at Garfield. O. Dressler is the President and F. Benedict, Secretary.

Passaic Worsted Spinning Mills

The Passaic Worsted Spinning Company is another well-known New Jersey enterprise. Christian Bahnsen is its President and Oscar Olsen Secretary.

A representative of the Attorney General said last night that pending receipt of information from Mr. Palmer, the custodian of enemy alien property, no statement would be issued.

A. G. Bruinier Joins Dicks David, Inc.

Mr. A. G. Bruinier, formerly president of the Kalle Color Co., who has been residing in England for the past four years, has returned to America.

Mr. Bruinier has decided to come out of his retirement with the purpose of reentering the dyestuff field. He has become vice-president and active in the management of the Dicks David Co., Inc., one of the most progressive manufacturers of dyestuffs and chemicals.

Mr. Bruinier has had a long experience in the dyestuff business both in this country and abroad, and brings to the American industry a wealth of color knowledge.

Dicks David Co., Inc., are manufacturers of a line of high grade aniline and basic colors, and have built up a large business, not only in this country but in foreign markets as well.

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Standard for Army Cloths

THE FOLLOWING SPECIFICATIONS OF ARMY CLOTHS WERE GIVEN OUT BY THE QUARTERMASTER'S DEPARTMENT THE EARLY PART OF THIS WEEK

The committee's report is as follows:

"Your board of inquiry into the subject of army cloths begs to report as follows and to submit the accompanying specifications. In arriving at our conclusions, we have been guided by the following considerations:

"First—Your decision to adopt the following fabric weights:

"Uniform cloth, 20 oz.

"Blankets, 4 lbs.

"Overcoating, 32 oz.

"Shirtings, 9½ oz.

"Second—So far as possible the available wool supply for the immediate future, both as to volume and grade, in its relation to army fabric needs.

"Third—Warmth and durability of fabrics.

"Fourth—The machinery of the country available for these fabrics.

"The specifications we have recommended will produce warmer and more durable fabrics than the present specifications.

"The goods will have more intrinsic value, fully sufficient to offset the increased cost.

"In considering the quality of wool specified in the four fabrics in connection with the large quantity of each required, it was our opinion that it was necessary to make the range of qualities as wide as practical, keeping fully in mind the instructions given to the committee.

"The shirting flannel and underwear will require wool 58s grade and finer.

"Twenty-ounce suiting, 46s to 56s.

"The blanket, also overcoating, 44s to 64s.

"The requirement for fine wool in the blankets and overcoatings in addition to improving the fabric will create an outlet for carbonizing wool out of the 200,000 bales Australian.

"We have recommended three specifications for the 20-ounce in order to untilize to the best advantage the available wool supply and machinery of the country.

"We have specified the use of shoddy in the blankets and overcoatings. Our experience as manufacturers warrants us in assuring you that the fabrics in which we have recommended the use of shoddy will be warm, strong and serviceable.

"We have established in the specifications strength tests which, adhered to, will insure the use of only the better grades of reworked wool."

The report is signed by the board of inquiry, as follows: Fred S. Clark, chairman; Stephen Metcalf, Jacob F. Brown, Charles H. Wilson, George H. Hodgson, Herbert E. Peabody, secretary; Major C. Nixon.

The specifications quoted by the board are the following:

Olive drab shirting flannel, 9½ oz.

Material—Single or 2-ply stock of

yarn dyed, olive drab, cotton warp and single worsted filling, olive drab mixture, ½-blood or finer. Whole contents of cotton not to exceed 40 per cent. of finished weight.

Color—To be a close match to standard sample.

Tests—The following are the tests which will be applied in the inspection:

1. Washing test: Boil for 10 minutes in a solution containing 80 grains of oleine soap (army issue) to pint of water.

2. Laundry test—Boil for 10 minutes in a solution containing 10 grains of dry carbonate of soda to one pint of water.

3. Exposure test — Expose to the weather for 30 days.

In any tests no greater change must take place than would be shown under similar test made at the same time on the sealed standard sample.

Width—To be not less than 54 inches, nor more than 56 inches wide, independent of selvage.

Weight—To weigh not less than 9½, nor more than 10½ ounces, to the linear yard.

Weave—To be a 4 harness twill, 2 up and 2 down.

Threads—To have not less than 64 threads per inch in warp and 64 threads per inch in filling finished.

Finish—To have the same degree and character of finish as shown by the standard sample thoroughly clean, free from crocking, nap slightly raised, slightly shorn and well pressed.

Strength — To sustain a tensile strength of not less than 50 pounds to the inch in the warp, and 35 pounds to the inch in the filling.

Twenty-ounce olive drab suiting (all worsted).

Material—Warp to be a 2-ply worsted, not lower in grade than 46s, or domestic quarter-blood, stock, top, slub or yarn, dyed. Filling to be single or 2-ply worsted, not lower in grade than 50 to 56s, or domestic ⅜-blood, olive drab mixture.

Color—To be a close match to sealed standard color.

Tests—The following are the tests which will be applied in the inspection:

1. Washing test—Boil for 10 minutes in a solution containing 80 grains of oleine soap (army issue) to one pint of water.

2. Laundry test—Boil for 10 minutes in a solution containing 10 grains of dry carbonate of soda to one pint of water.

3. Exposure test—Expose to weather for 30 days. In any tests no greater change must take place than would be shown under similar test made at the same time on the sealed standard sample.

Width—To be not less than 56, nor more than 58 inches wide, independent of selvage.

Weight—To weigh not less than 19½, nor more than 20½ ounces.

Selvage—To have no dividing threads and to be of same material and color as warp.

Weave—Four harness twill, two up and two down preferred, but other weaves will be considered provided fabric is sufficiently close, firm and compact.

Threads—To have not less than 56 threads to the inch, finished in the warp,

and 52 picks to the inch, finished in the filling.

Strength — To sustain a tensile strength of not less than 100 pounds to the inch in the warp and not less than 85 pounds to the inch in the filling.

Finish—To have the same degree and character of finish as shown by the sealed standard sample, thoroughly clean.

Twenty-ounce O. D. suiting, worsted warp, wool filling.

Material—Warp is to be 2-ply worsted, not lower in grade than 46s, or domestic quarter-blood, stock, top, slub or yarn dyed, olive drab or olive drab mixture. The stock mixture of filling to be 70 per cent. of wool not lower in grade than 56s and 30 per cent. of noils and garnet, not lower than 50s, to be olive drab mixture.

Color—To be a close match to the sealed standard sample.

Tests—The following are the tests which will be applied in the inspection:

1. Washing test—Boil for 10 minutes in a solution containing 80 grains of dry carbonate of soda to one pint of water.

2. Laundry test—Boil for 10 minutes in solution containing 10 grains of dry carbonate of soda to one pint of water.

3. Exposure test—Expose to weather for 30 days. In any tests no greater change must take place than would be shown under similar test made at the same time on the sealed standard sample.

Width—To be not less than 56, nor more than 58 inches wide, independent of selvage.

Weight—To weigh not less than 19½, nor more than 20½ ounces to the linear yard.

Selvage to have no dividing threads and to be of same material and color as warp.

Weave—Four harness twill, two up and two down preferred, but other weaves will be considered provided fabric is sufficiently close, firm and compact.

Threads—To have not less than 50 threads to the inch finished in the warp and 48 picks to the inch finished in the filling.

Strength — To sustain a tensile strength of not less than 75 pounds to the inch in the warp finished and not less than 60 pounds to the inch in the filling finished.

Finish—To have the same degree and character of finish as shown by the sealed standard sample, thoroughly clean.

Twenty-ounce O. D. suiting—all wool.

Material—To be woolen yarn not lower than 50s grade, or domestic high one-quarter blood, olive drab mixture. The admixture of reworked wools is prohibited. The use of noils, broken sliver, from cards, mules and spinning frames and of carded or garnetted thread waste made from the mixture of this fabric to an amount of not more than 20 per cent. of the weight is permitted.

Color—To be a close match to sealed standard sample.

Tests—The following are the tests which will be applied in the inspection:

1. Washing test—Boil for 10 minutes

in a solution containg 80 grains of oleine soap (army issue) to one pint of water.

2. Laundry test—Boil for 10 minutes in a solution containing 10 grains of dry carbonate of soda to one pint of water.

3. Exposure test—Expose to weather for 30 days. In any tests no greater change must take place than would be shown under similar test made at the same time on the sealed standard sample.

Width—To be not less than 56, nor more than 58 inches wide, independent of selvage.

Weight—To weigh not less than 19½, nor more than 20½ ounces.

Selvage to have no dividing threads and to be of same material and color as warp.

Weave—To be a four harness straight twill to the right, two up and two down.

Threads—To have not less than 47 threads to the inch finished in the warp, and 45 picks to the inch in the filling.

Strength — To sustain a tensile strength of not less than 50 pounds to the inch in the warp and not less than 45 pounds to the inch in the filling.

Finish—To have the same degree and character of finish as shown by the sealed standard sample, thoroughly clean.

Thirty-two-ounce olive drab overcoating.

Material—To be woolen yarn, composed of 55 per cent. wool, grade 44s or finer, 10 per cent. wool, grade 58s or finer, 35 per cent. reworked wool or noils.

Maximum allowable percentage of residue on boilout, 2½ per cent.

Broken sliver from cards and mules made from the mixtures of this fabric not exceeding 10 per cent. may be added to the blend.

Color—To be an olive drab mixture and a close match to sealed standard sample.

Tests—The following are the tests which will be applied in the inspection:

1. Washing test—Boil for 10 minutes in a solution containing 80 grains of oleine soap (army issue) to one pint of water.

2. Laundry test—Boil for 10 minutes in solution containing 10 grains of dry carbonate of soda to one pint of water.

3. Exposure test—Expose to weather for 30 days. In any test no greater change must take place than would be shown under similar test made at the same time on the sealed standard sample.

Width—To be not less than 56, nor more than 58 inches wide, independent of selvage.

Weight—To weigh not less than 32 ounces nor more than 34 ounces to the linear yard.

Selvage—To have no dividing threads and to be of same material and color as warp.

Weave—To be a six harness broken twill, two up and three down.

Threads—To have not less than 36 threads to the inch finished in the warp and 36 picks to the inch finished in the filling.

Strength — To sustain a tensile strength of not less than 80 pounds to

the inch in the warp and not less than 65 pounds to the inch in the filling.

Finish—To have the same degree and character of finish as shown by the sealed standard sample, thoroughly clean.

Four-pound olive drab blanket.

Material 55 per cent. wool grade 44s or finer, 10 per cent. wool grade 60s or finer, 35 per cent. reworked wool or noils.

Maximum allowable percentage of residue of boilout, 2½ per cent.

Broken sliver from cards and mules made from the mixture of this fabric not exceeding 10 per cent. may be added to the blend.

Color—Olive drab mixture to be a good match to standard sample.

Tests:

1. Washing test—Boil for 10 minutes in solution containing 80 grains of oleine soap (army issue) to one pint of water.

2. Laundry test—Boil for 10 minutes in solution containing 10 grains of dry carbonate of soda to one pint of water.

3. Exposure test—Expose to the weather for 30 days.

Size—To be not less than 7 feet, nor more than 7 feet 3 inches long and not less than 5 feet 6 inches, nor more than 5 feet 9 inches wide.

Weight—To weigh not less than 4 pounds, and not more than 4 pounds 8 ounces. Blankets weighing less than 4 pounds shall be rejected unless when subjected to a condition or dry fiber test the weight thus found, with 11 per cent. added (for normal regain of moisture allowable), will bring the weight up to or over 4 pounds.

Weave—To be a four harness twill, two up and two down.

Threads—To have not less than 27 threads to the inch in the warp and not less than 30 threads in the filling in the finished cloth.

Strength — To sustain a tensile strength of not less than 55 pounds to the inch in the warp and not less than 50 pounds to the inch in the filling.

Border—Not required.

Finish—To have the same degree and character of finish as shown by accepted new standard. Thoroughly clean and well filled. The ends to be secured from raveling by an overlock stitch, the thread employed to conform in shade to the blanket.

Stamping—All blankets to be stamped "U. S." at mill. The Government will furnish the stamp and formula.

Label—In one corner there should be neatly stitched a piece of label cloth on which shall be printed the name of the contractor, date of contract and name of depot, together with specification number, leaving a blank space at bottom for the name of the inspector.

Notice to Subscribers

Owing to the disturbance caused by war conditions in the postal service, we cannot guarantee prompt delivery of this journal through the mails. For delays in such delivery, while they should be reported at once to this office, we cannot accept blame.

The name of the Midland Chemical Company, Dubuque, Iowa, has been changed to the Midland Chemical Laboratories, Inc., with a capital stock of $200,000.

What the Consumer Thinks

The Mianus Mfg. Co., Coscob, Conn.:
"American industries should be protected to cover differences in cost between here and abroad."

Broad Brook Co., Broad Brook, Conn.:
"Tariff should be enough to enable domestic manufacturers to build up their business on a permanent basis."

Patrick Duluth Woolen Mill, Duluth, Minn.:
"Sufficient protection to encourage the manufacturer."

Lauderdale Cotton Mills, Meridian, Miss.:
"We are of the opinion that we have a sufficient protective tariff on dyes and I think after a few years this tariff should be gradually reduced or entirely eliminated. The dye manufacturers of this country are now getting enormous prices for their products and should be able to build up their plants, also ample reserve capital so as to enable them to compete with the entire world."

Woodcock Woolen Mills, Waterside, Pa.:
"A high protective tariff on American made dyes."

Bennet & Aspden Co., Manayunk, Phila., Pa.:
"Sufficient protection to foster home industries."

Bredford Durfee Textile School, Fall River, Mass.:
"Ad valorem — sufficient to make American-made dyes possible."

Newton Paper Co., Holyoke, Mass.:
"I think the war has taught us to know that we Americans should make our own dyes hereafter."

Chatham Mfg. Co., Elkin, N. C.:
"Sufficient tariff to protect and foster American dye manufacturers."

Amos Abbott & Co., Dexter, Me.:
"Enough to keep the industry flourishing in this country."

The Davies Hosiery Co., Reading, Pa.:
"We should have a fair protective tariff—nothing more."

Geo. W. Watt Woolen Co., Norristown, Pa.:
"Sufficient to develop and maintain this industry."

Cyril Johnson Woolen Co., Stafford Springs, Conn.:
"Protection enough to enable the American industry to maintain itself against German competition."

Eastern Mfg. Co., South Brewer, Me.:
"Protective tariff should be advocated."

Locke Cotton Mills Co., Concord, N. C.:
"A high tariff."

Gibson Mfg. Co., Concord, N. C.:
"Just enough tariff to protect the American laborer."

Falls Co., Norwich, Conn.:
"Give them ample protection."

Hygienic Blanket Mills, Hubbardston, Mass.:
"Only sufficient tariff to meet foreign competition."

Belle-Vue Mfg. Co., Hillsboro, N. C.:
"Just enough to allow us to make all our own colors."

S. Austin Bicking Paper Mfg. Co., E. Downingtown, Pa.:
"We believe a protective tariff should be stiff enough to encourage American-made dyes."

(*Continued on page* 13)

AMERICAN DYESTUFF REPORTER
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Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

MYRON DREW REESER, Managing Editor

The Textile Exhibition

Big Event to be Held at Grand Central Palace, April 29th to May 11th. Dyestuff Industry Well Represented.

THE Sixth National Exhibition of the Textile Exhibitors' Association will be held in the Grand Central Palace, New York, beginning Monday, April 29th, and continuing until Saturday, May 11th, inclusive. This will be the first exhibition of its kind to be held in New York City, and from present indications will be the largest ever held anywhere in the world. It will include exhibitors of textile machinery, finished textiles and all industries closely allied to the production of textiles—in this latter classification, of course, the American dyestuff industry is included.

It is confidently expected that this event will bring to New York the largest gathering of textile men which has ever congregated for an affair of this character. Several large textile associations are arranging conventions to be held in New York during the period covered by the Exhibition—among them may be mentioned the National Association of Cotton Manufacturers and the American Cotton Manufacturers' Association, who will meet in joint sessions on May 1st, 2nd and 3rd. The National Wool Fiber Association, and a number of organizations connected with the silk, woolen and allied trades, will also meet in New York while the Exhibition is on.

Many foreign nations as well as the United States Government are making official exhibits of the textile products of their respective nations and advices to the promoters of the Exhibition indicate that a very large number of buyers and textile experts from foreign countries will be in attendance. The Textile Exhibitors' Association is composed of many of the country's most prominent makers of mill machinery. The purpose of the National Exhibit is educational; it affords an opportunity for these manufacturers to show the trade the last word in textile machinery. Naturally they prefer an occasion when they can meet the trade in one central place.

The Exhibition will be of particular interest to persons concerned with the production and use of dyestuffs because of the exhibits to be shown by several of the leading dyestuff manufacturers of the country, prominent among whom may be mentioned the National Aniline & Chemical Company, the DuPont American Industries, Marden, Orth & Hastings Corporation and Frank Hemingway, Incorporated. The National Aniline & Chemical Company in particular is preparing an exhibit which will show not alone samples of the various dyestuffs produced by this concern but many samples of finished textiles dyed with their colors and also the actual process of dyeing in operation. The National Company is devoting a great deal of thought and money to this exhibit and it is believed that their booth will be one which it will pay every one interested in the dyestuff industry to visit.

The DuPont Company has reserved a very extensive space but we understand that their exhibit will not go into such detail as some of the others because of the fact that they are not as yet quite ready to show a full line of colors. They will, however, be prepared to discuss dyestuff questions with those interested and to indicate the directions in which their dyestuff-producing efforts will be centered during the coming year.

All in all, we believe that the showings of machinery, equipment and finished textiles will be very well worth examination by all who are concerned in the production of textile products, and we earnestly suggest that all of our readers who find it possible to be in New York at this time make it a point to be in attendance.

The AMERICAN DYESTUFF REPORTER will have a booth at the Exhibition, where we will be very glad to welcome our readers and to extend all possible courtesies.

A special Exhibition Number of the REPORTER will be issued on Monday, April 29th. One of the chief features of this issue will be a complete history of the development of the American dyestuff industry compiled from all available sources and accompanied by numerous illustrations. As a supplement to this history, it is our intention to mention briefly the principal firms which have taken up the manufacture of dyestuffs in this country.

To facilitate our preparation of this special issue we should be glad to receive from any firms who are manufacturing aniline or natural dyestuffs information as to the exact nature of the colors which they are prepared to deliver to the trade, together with the dates when they began manufacturing and any other data which might be of interest to our readers.

New Dyes

The past week has seen the development of another Fuchsine which appears to meet all requirements. The crystals are as large as grains of wheat, well formed and of perfect solubility. The product contains no matter which separates from the dyebath or discolors the shade. The brilliancy is equal to the best Germany ever made and we only hope the manufacturer will be able to fill the orders. There was one a few months ago which seemed to be the last word, but which apparently was only a laboratory product, and deliveries were quite inferior. This latest Fuchsine is made by a more reputable firm and we hope to see a large business develop.

At the same time as the Fuchsine just mentioned we note a new Malachite Green from another factory. This green has all the qualities which are demanded. The solubility is perfect, the shade clear and brilliant and the tinctorial power somewhat above the

average. We are pleased to see the progress that the makers of these colors are making. The early attempts in both dyes were not exactly satisfactory and the consumers hesitated to risk spotting their goods by the use of them. This danger is now past and the only other step necessary is to increase the output to a point where the entire demand can be satisfied.

Coal-Tar Dyes and Chemicals

An unsettled condition prevailed in the coal-tar dye market this week owing perhaps to imports being denied after April 15. The export demand has been rather good while the domestic demand has remained rather quiet, most activities centering around the toluol derivatives. The demand for Aniline colors still remains about the same with the exception of the demand of the textile trades for late spring and summer offerings. The prices of dye bases and dyewoods remain firm despite the comparatively small demand for many of the items. The scarcity of ocean tonnage is perhaps a factor in holding this market steady.

Perhaps the most promising feature of the chemical market this week was the placing of heavy contracts for deliveries of caustic soda and soda ash at a price below the current quotation. It is noted that the import restrictions do not affect this market as greatly as might be supposed since a number of the products are of domestic production. There were few changes in prices during the last week and the general tone of the market is rather steady.

Mode Shades Sulphur Colors

Dr. Louis J. Matos, Textile Chemist, National Aniline & Chemical Co., Inc.

The application of Sulphur colors to cotton in various stages of manufacture has been familiar in the majority of cotton dyehouses. Since the outbreak of the war there has been a constantly increasing demand for shades which are useful not alone for current fashions but particularly for military and sportsmen's goods. The sulphur colors lend themselves most advantageously for this class of work. The base shades are browns, varying from the extremes of yellow through the various khaki tones, olive drab, current brown shades to the extreme heavy chocolate tones. By the aid of these several groups the dyer is enabled to produce at will an extensive range of colors meeting every commercial requirement.

The dyeing of Sulphur colors has been greatly extended to mills that formerly did not do this class of work, and in consequence a number of complaints arise from dyers not fully familiar with the application of these dyes regarding uneven results and defective tones. In the majority of instances it was found that lack of experience was wholly responsible for the results obtained and in almost every instance the trouble was due to the fact that the dye vessels employed were equipped with the usual copper pipes and brass fittings, it being a well known fact that copper in any form and brass, or even bronze, is destructibly detrimental to the Sulphur dye. Iron alone should be

used and if possible, particularly for piece goods, the jigs or pans should be constructed of this metal. Wood is not objectionable, but it has a disadvantage of occasionally cracking and causing some of the dye solution of one kind to soak into the wood which afterwards cannot be well washed out before the kettle can be used for other shades.

Cotton piece goods are dyed after a preliminary treatment having for its object the removal of size or other dressing that the fabric may contain. Sometimes this preliminary treatment has not been carried out as effectively as desired, in consequence of the traces of dressing remaining in the cloth which causes a more or less imperfect dyeing of the fabric. Shaded areas are noticed in the finished goods, sometimes heavier in tone than the majority colors of the entire fabric, at other times these areas are lighter producing a distinctly mottled aspect. It, therefore, becomes necessary that the preparatory treatment of the cloth should be given sufficient time to insure the complete removal of all sizes and dressings, and at the same time completed with a thorouh wash to remove the desizing agents.

Malting is most desirable to produce a fabric clean and free from all starch residues, but here again this process cannot be hurried, sufficient time must elapse at a uniform temperature so that every particle of starch may be rendered completely soluble. All heavy coarse goods to be dyed khaki and other current shades can be successfully prepared by being wetted-out with a good quality of soluble oil. This product has a property of dissolving completely at a moderate temperature all the natural oils and waxes common to cotton goods; and, although it has no solvent action upon the starch or the dressing it loosens it to such an extent that any traces remaining have no influence upon the shade as dyed.

The following Sulphur colors have been found well suited for the production of shades under consideration:

Sulphur Yellow M T
Sulphur Brown S A P
Khaki No. 01672
Khaki C C.

These colors produce a good full shade with 8% when dyed in the usual manner at the boil with

12% Sodium Sulphide Crystals
30% Common Salt
15% Soda Ash.

When dyed in the jig the desire is to produce the proper depth of shade with the correct penetration in the fewest number of runs. This does not necessarily mean that the work is to be hurried since all Sulphur colors do not penetrate the cloth at the same rate, and consequently where two or more colors are used in combination the rate of dyeing has to be governed by the rate at which the slowest dyeing dye in the mixture comes on to the cotton. As a rule six to eight "ends" are sufficient but sometimes circumstances are such that two additional "ends" are necessary for proper fullness.

Of the three Sulphur Yellows the yellowest in tone is Sulphur Yellow B W which may be used for shading.

Sulphur Brown T D and Sulphur Brown G W have a decided red tone and are useful as shading colors.

Khaki A A, Khaki B M, and Khaki No. 01603 are of the olive drab type and should be found useful for many purposes, but particularly as self colors.

Two useful combinations are made as follows:

One, a yellowish tone of brown, is produced with

1½% Sulphur Yellow M T
1½% Sulphur Brown S A P

dyed with

7% Sodium Sulphide Crystals
20% Common Salt
5% Soda Ash.

The other shade is of a distinctly greenish tone and is produced with

1½% Sulphur Green S A P
4 % Sulphur Yellow B

dyed with

12% Sodium Sulphide Crystals
30% Common Salt
5% Soda Ash.

The Sulphur Green S A P mentioned in the preceding formula is a very desirable shading color possessing a peculiar soft greenish tone which will lend itself desirably as a shading color, while as a self color the shade produced should find considerable usefulness for corduroy used for decorative and other similar purposes.

Sometime in dyeing Sulphur colors upon cotton piece goods the shade obtained is heavier than the sample being matched, and many dyers who have had experience in the application of these colors have not been successful in reducing the depth of shade obtained.

The Sulphur colors have a peculiar property of being particularly fast to the influence of usual chemicals found in dyehouses, and where the shade obtained has been too heavy its proper uniform reduction is not easy. As a suggestion, when this accident occurs the dyer should prepare a bath of Sodium Sulphide alone and pass the goods at a uniform rate of speed through it at a temperature of about 160°. This usually dissolves a sufficient amount of color thereby reducing the shade below that of the sample and enables the dyer to commence again and feed on color in a fresh bath and cautiously reach the desired end.

Like all cotton dyeing, the one point to constantly keep in mind is to take swatches at regular intervals and stop feeding the dye end of the bath at the right moment. Of course, after a definite formula has been established the usual oversight of the second hand of the dyehouse is quite sufficient to warrant a regular output of uniform tone.

The colors above referred to are well illustrated in one of the folders published by the National Aniline & Chemical Company, Inc., which shows sixteen dyeings that will appeal at once to practical cotton dyers. Copies of this folder may be obtained upon request made to any of the branches of the company.

Statement of the Ownership, Management, Circulation, etc., Required by the Act of Congress of August 24, 1912, of American Dyestuff Reporter, published weekly at New York, N. Y., for April 1, 1918.—State of New York, County of New York, ss. Before me, a notary public in and for the State and county aforesaid, personally appeared Dexter W. Hewitt, who, having been duly sworn according to law, deposes and says that he is the business manager of the American Dyestuff Reporter and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Name of Publisher, Hewitt Publishing Corporation; Post office address, 470 Fourth Avenue, New York, N. Y.; Editor, none; Managing Editor, Myron D. Reeser, 470 Fourth Avenue, New York, N. Y.; Business Managers, Dexter W. Hewitt, 470 Fourth Avenue, New York, N. Y.; A. P. Howes, 470 Fourth Avenue, New York, N. Y. 2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.) Hewitt Publishing Corporation, 470 Fourth Avenue, New York, N. Y.; Dexter W. Hewitt, 470 Fourth Avenue, New York, N. Y.; Elisha Hewitt, 470 Fourth Avenue, New York, N. Y.; A. P. Howes, 470 Fourth Avenue, New York, N. Y. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. (Signature of business manager) Dexter W. Hewitt. Sworn to and subscribed before me this 28th day of March, 1918. E. De Haven. (My commission expires March 30, 1919.)

Conference on Dye Standardization

At a private conference on March 28, at the Waldorf Astoria Hotel, of representative factors from all branches of the women's apparel industry, plans were perfected for an official meeting to take place this week to be attended by the important interests of the cloak, suit, dress, waists, shoes, millinery, hosiery and glove trades for the purpose of discussing color stabilization and co-ordination of the industries named. It was also stated that the plan under consideration has also something to do with aiding the Commercial Economy Board of the Council of National Defense in its campaign for conservation of raw material. The color standardization plan is said to be favored by the millinery trade factors. Color experts are to be consulted, at the conference scheduled for this week, and complete details will be outlined by the men who have introduced this idea.

A full report of this meeting will appear in the following issue of The Reporter.

What the Consumer Thinks

(*Continued from page 7*)

Aetna Hosiery Co., Worcester, Mass.:
"Good protection."

Crawshaw Carpet Co., Newburgh, N.Y.:
"Enough to equalize costs but not enough to eliminate dyes not made in America."

The Warrenton Woolen Co., Torrington, Conn.:
"Sufficient to adequately protect the domestic manufacturer."

Henry R. Miller Co., Reading, Pa.:
"American manufacturers should be protected all that's possible."

Oakland Mills, Taunton, Mass.:
"Tariff enough to establish paying business here."

Art Silk Dyeing, Paterson, N. J.:
"No protective tariff as the foreign dyestuffs are far superior at present although some of our domestic dyes compare favorably with foreign makes."

Redfern Lace Works, Somerville, N. J.:
"As high a tariff as can be obtained."

(*Continued in next issue*)

Ascertaining the Indigotine Contents of Natural Indigo

Indigotine can be estimated as follows: 1 grm. of well-dried indigo is mixed (in a bottle with a ground stopper) with 10 grms. of garnets or glass beads and 20 c.c. of sulphuric acid mixture (composed of 3 parts of concentrated sulphuric acid and 1 part of oleum containing 20 per cent. of free SO). The mass is thoroughly mixed and is afterwards shaken occasionally over a period of 12 hours or so, until solution is complete, the whole being then poured carefully into cold water and the bottle thoroughly rinsed out. The aqueous solution is boiled for ten minutes and filtered, the filter being washed with hot water until the washings become colorless, and the filtrate then made up to a litre. Fifty cubic centimeters of this solution are mixed with 900 c.c. of distilled water, and the liquid titrated with 0.05 per cent. potassium permanganate solution until the blue color becomes golden yellow without green reflection. In order to accustom the eye to this end-point, which is not sharp, it is advisable to make a comparative test with pure indigo of known strength: 1 c.c. of the permanganate solution corresponds with about 0.00125 grm. of indigotine. In order to prepare pure 100 per cent indigo for purposes of comparison, 10 grm. of pure, powdered artificial indigo (98 per cent) marked B. A. S. F. or M. L. B. I.) are treated in a beaker with 120 grms. of caustic soda solution (sp. gr. 1.21), 330 grms. of concentrated sodium hydrosulphite solution and 100 grms. of water (or, if 50 grms. of 20 per cent, indigo paste are taken, only 60 grms. of water are added) the mixture being heated on a water-bath at 40° to 50° with occasional shaking and the air being gradually expelled from the beaker by means of a current of coal-gas. When solution is complete, the liquid is rapidly filtered and a current of air passed into the yellow or greenish filtrate. The precipitated indigo is collected on a hardened filter and washed first with hot water, then with hot dilute hydrochloric acid (30 c.c. of the concentrated acid diluted to a litre), next with water again, and repeatedly with alcohol and with alcohol and ether. When dried at 101° to 110° until of constant weight, the product represents pure 100 per cent indigo.

New Process for Printing Fabrics

G. Prifolel, of Linwood, Penn., assignor to the Congoleum Co. of Philadelphia (Am. Pat. 1,255,049, of Jan. 29, 1918) describes a new method for printing designs with coal-tar colors upon carpets, tapestries, and the like, aiming at introducing the color as deeply as possible into the body of the fabric.

The process consists essentially in printing the fabric with a composition consisting of an aniline color and a starchy vehicle, subjecting the fabric to the action of moisture and heat to cause the aniline colors to penetrate the fabric, then drying the fabric to solidify the vehicle, then removing the vehicle from the fabric, leaving the aniline color therein, and then sizing the back of the fabric.

By the new process, it is possible to print elaborate designs and to cause the dye to penetrate the full depth of the fabric, so that the entire surface has the same appearance as a fabric in which the strands are dyed prior to being woven.

It is claimed that more elaborate designs can be made by the improved process than by present methods of printing fabrics and that the cost of printing is considerably reduced.

Logwood Dyeing

Isidor Kitsee of Philadelphia (Am. Pat. 1,254,914, of Jan. 29, 1918 announces an improvement in the method of dyeing with logwood, which is capable of extension likewise to other natural colors.

The following directions are contained in the patent.

To dye goods black: To 100 parts by weight of a logwood dye solution (which preferably is purified by the addition thereto of from 1 to 10 parts of sulphurous acid) are added 3 parts of a concentrated solution of chloride of zinc and 5 parts of a concentrated solution of copper ammonium chloride. The chloride of zinc may be added to the dye solution at any time after the latter is prepared, but the copper ammonium chloride should not be added until just before it is desired to dye the goods. The process may be carried out at ordinary temperatures. After the goods are dyed, they may be developed with bichromate and nitrate of potassium, or with any other suitable developing substance.

To dye goods blue:

Dye solution, 100 parts; chloride of zinc (concentrated solution), 3 parts; copper ammonium chloride (concentrated solution), 6 parts.

The dyed goods should preferably be developed in sulphate of copper.

If, for chloride of zinc, chloride of tin be substituted, a red color may be produced. To produce a brown color, hydrochloric acid may be added.

A person versed in the art will have no difficulty in determining what compounds and what proportions are adapted to produce the particular shades desired. Broadly speaking, it may be stated that the greater the proportion of the zinc salt, the darker the shade of black, and the greater the proportion of ammoniated copper, the lighter the shade of blue.

Basic Dyes on Wool

Question: Are basic dyes of any value on wool?

Answer: There have been many instances of where Methylene Blue, Victoria Blue and Methyl Violet have been dyed even on loose wool. The dyebath must be perfectly neutral, except with Victoria Blue, and a full shade can be obtained which will resist washing and even fulling. The fastness to light is not good but they may find use for brilliant color effects where they are not subjected to severe conditions. Fuchsine would probably answer as well but Malachite Green and Auramme are not reliable as wool colors.

Stripping Off a Direct Dye

Question: What is the best way of partly stripping off a direct dye without using bleach or hydrosulphite?

Answer: Boiling hot water with a little Phosphate of Soda will generally remove over half the dye from any direct dyeing. After working for 15 minutes rinse in pure water.

Dyeing Silk Stripes on White

Question: How may worsted goods containing a silk stripe be dyed so as to leave the silk white?

Answer: This is entirely a question of selecting the proper dyes. In the main, the dyes which are suitable for such work are after-chrome colors which undergo a considerable change in shade during chroming. The Chromotrope series and related colors are the best examples. There are a few acid dyes which have this property but the series is at present incomplete. In dyeing such chrome colors as are suitable it is advisable to finish the dyeing with an extra addition of acetic acid and boil hard. Hard boiling in an acid bath will generally strip the color from silk. After chroming, if the silk is still tinted, it may dry out white, but if too much color remains a little hydrosulphite will clear the silk without affecting the wool.

The Croton Chemical Company of New York City has been incorporated with a capital of $155,000 by H. P. Ihrig, E. R. Voltmer, and F. C. Schmits.

American Dyestuff Reporter

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 2 New York, April 15, 1918 No. 11

What Particular Colors Should Manufacturers Develop?

WE WOULD LIKE TO HAVE AN EXPRESSION ON THIS VITAL SUBJECT FROM EVERY LARGE CONSUMER OF DYESTUFFS IN AMERICA

THIS article was written at the suggestion of one of the most prominent manufacturers of intermediates and dyestuffs in this country.

It is reproduced in the hope that the Textile Mills of America may realize that they have a vital part in the development of this infant industry in America.

This country can place every confidence in the ability of American chemists to solve the problems of dyestuff manufacture, but this alone will never make America independent of foreign countries.

It is absolutely necessary that they know just what colors to concentrate upon so that there may not be overproduction of any one color or colors. This is the part that the consumer must play in the building of the industry. His suggestions are of inestimable value to the manufacturer and would save him valuable time and money and enable the intermediate manufacturer to conserve raw materials.

By this reference to the saving of raw materials we do not mean that there is any shortage of them in this country. On the contrary we are now producing quantities of necessary intermediates many times greater than is required to supply all demands in normal times.

The raw material situation need never worry the manufacturer. There are, however, other difficulties that are of just as much importance. Every color chemist who has had any actual manufacturing experience knows that only by being in daily contact with the product he is working upon can he be certain of uniformity.

By concentrating upon one particular product he can detect at once the slightest inaccuracy in the process and variation in color.

On the other hand if he is called upon to change from one product to another every few weeks many slight details in the process escape him. The result is a noticeable loss in yield, a tremendous increase in the cost of production and lack of uniformity. When we consider that one of the most serious difficulties confronting the industry to-day is the lack of uniformity, we all agree that something must be done. This lack of uniformity, in most instances, is due to the necessity of producing more colors than actual plant equipment will permit.

Any manufacturer will agree with us in the use of the word "necessity," for, as conditions now exist, he must make

as many colors as possible in order to survive.

The first thing to do toward bettering conditions is to ascertain definitely what colors are most in demand. Not the demand of the export field nor the dealer demand but the actual need of the color consumers here in America.

There is only one way to find this out and that is by a direct appeal to the textile and allied trades.

Will You Who Consume Dyestuffs Help Us in the Preparation of a List of Those Colors That Are Absolutely Necessary at This Time.

This direct appeal to you is written after careful deliberation. We are convinced that the solution of many of the difficulties confronting manufacturers to-day, lies in the opinion of the *actual consumer of their products.*

The following letter was received from one of the best known intermediate manufacturing plants in America. It should be answered by every Textile mill in this country that is interested in the success of the industry.

American Dyestuff Reporter,
New York, N. Y.
Gentlemen:

Having concluded our present program for the manufacture of dyes, we at the present time are desirous of undertaking the manufacture of such dyes as are in greatest demand and are writing you to ask if you will be kind enough to let us have a list of these colors from which a selection will be made of those that fit in best with our present production of Intermediaries, Chemicals, etc., and those that will serve the trade in general to best advantage.

Thanking you in advance for favoring us with your reply in this connection, we remain,

Yours very truly,

If each large Textile mill in this country were to answer this letter the information thus gained will be of inestimable value to manufacturers.

Let us assume that a large percentage of the replies call for Fuchsine and Malachite Green.

We all know very well that there are a number of manufacturers now engaged in producing Fuchsine. Samples of this product that have come to our attention, are all that could be asked for as regards solubility and brilliancy.

The same applies to Malachite Green. Dyeings that we have seen have all of the qualities that could be demanded.

We then can dismiss the problem of manufacture as solved, but can we say the same of the problem of delivery? This problem can be solved by consumers if they are willing to lend their aid to the manufacturer.

In conversation a few days ago with a manufacturer we were informed that "As long as the demand for Malachite Green keeps up we will make it and when the demand falls off we will switch to another color."

This sums up the attitude of a number of small manufacturers regarding this problem of production. Can we hold him fully to blame for this? The answer is, no! and the problem of production is the problem of consumer as well as manufacturer.

If you respond to this appeal, as we feel sure you will, the information thus gained will immediately be brought to the attention of the real manufacturers of intermediates and finished dyestuffs. Under no circumstances will the name of the writer be divulged.

In answering this question a lengthy letter is unnecessary. We would suggest that you simply say, "We would advise that manufacturers concentrate upon the following"; then mention those colors that are necessary for the production of your mill.

This is a direct appeal to the real source of information and we have time and time again said that manufacturers could be assured of the support of consumers.

Please do not make it necessary for us to retract this statement.

We are in receipt of an announcement to the effect that A. F. Bornut Brothers & Co., of Philadelphia, Pa., are planning the construction of a new one-story addition to their dye manufacturing plant

We reproduce the following with the comment that appears below.

The Dyestuff Industry of Japan

By M. Iketani, Staff Writer, "The Japan Salesman"

It is understood that the German dyestuff manufacturers, who supplied 75 per cent. of the world's demand and 90 per cent. of the Japanese demand before the war, have been combined into a big system with a capital of 200,000,000 yen. This combination is calculated to enable the German manufacturers to cut down the cost of production greatly and to enter upon the after-war commercial war with force. Another most important question, to which our serious attention is called, is that America will come to supply dyestuffs after the war in much larger quantities than at present. Japan is now supplied by America with direct black and direct brown, basic dyes blue and yellow and acid dyes red and black. **These American dyes are not equal to the German products, but they will probably suffice to meet the Japanese demand for the cheap quantities. The American dye stuff industry has been really extended since the war.**

The appearance of this article so antagonized a large manufacturer of this city that he personally brought it to the offices of the Reporter.

This alone proves its utter falsity, for unless it had sufficiently over-balanced the plan of his daily routine this publication would never have been graced with his presence.

To Mr. M. Iketani of Japan we are indebted for an editorial that was unsolicited. Mr. Iketani, we thank you and at the same time take the liberty of saying that you are a much misinformed gentleman.

Each dyestuff now being manufactured in this country (by reputable companies) is, type for type, equal to any German dye that was ever manufactured.

This statement is made after careful deliberation and expenditure of time and because "I have been shown."

Mr. Iketani, would that we could show you, but eventually you will learn.

Editor.

Standard Shades Proposed

Co-ordination on Color Question

Important action has been taken by men prominent in the women's apparel industries toward standardization of colors for the entire trade. The conference was held at the Waldorf-Astoria, there being seventeen of the most influential factors in the various branches of the business present. Frederick Bode, president of the Textile Color Card Association, presided.

The chief object of the meeting was to effect a co-ordination of the various garment trades on the color question and plans were completed to put the project in immediate operation for the Fall season. The effects of this co-operation will be manifold, conservation of fabrics, dyes, materials and labor in line with the wishes of the Government, being one of the most

important. It is estimated that several million dollars will be saved annually to manufacturers alone. This matter was first taken up several weeks ago at a meeting of the color committee of the United Waist League of America, at which A. F. Ramsay, of Ramsay, Drew & Co., presided. It was determined at that time that a general conference be held of representatives of the leading garment manufacturers.

Color Committee Appointed

Present at the meetings were representatives of the silk, woolen, cotton, cloak, suit, hosiery, dress, shoe and glove industries, all of which will adopt the plan of standardization of colors. One man from each of these branches has been appointed to the color committee of the Textile Color Card Association to further the work. Certain shades of each color will be decided on for a current season and manufacturers in all lines will know in advance just what colors they are to work on. Thus, the waste of former seasons will be avoided for both wholesaler and retailer and thousands of yards of material and much labor will be conserved.

A pamphlet has been prepared by the Textile Color Card Association advocating the use of the standard color card, which will be mailed to ten thousand leading retailers all over the country. This was submitted by Mr. Bode at the meeting, and the idea was concurred in by all present, as it was thought that it would be of distinct advantage to both the retailer and the ultimate consumer.

Besides the evident saving for the trade that this step will effect, there is the important consideration of the economy of fabrics which are scarce and high in price. The Government has expressed its desire that every possible effort be made by cutters of cloth that a minimum yardage be used to cover the requirements of the country. Radical action has already been taken in many lines to stop overproduction and accumulation, and the decision arrived at yesterday for standardization of colors for all trades in the apparel industry will be a long step toward putting this business on a more stable and sensible foundation. The men who attended the meeting yesterday were enthusiastic over the possibilities contained in the idea. It is felt that an important step has been made toward bringing these industries into closer relationship, and that this is only the beginning of a better co-operation on problems of manufacture and merchandising.

Rhodamine B

Rhodamine B is now being manufactured in this country. In limited quantities it is true, but the product is equal to that manufactured in Germany. We are informed from an authentic source that the chemist who is making this product has been engaged in the manufacture of Rhodamine in Europe for many years.

We are not in a position to mention the name of the company producing this, but we can say that Rhodamine is now being made where the shores are washed by the spray of the Pacific.

A Tribute

The followig is taken from an address delivered by Milton S. Sharp before the Bradford Dyers Association of England. If this is the opinion of the British mind regarding our color development let us not allow it to change.

Mr. Sharp refers to the lack of united action on the part of British manufacturers and then says:

"Look at what amalgamation of the various interests in the United States has already achieved; the growth of the American dye industry has truly been little short of marvellous. In the years before the war the average annual value of imported colors was $10,000,000, but the progress of the industry in that country has been so great that during the ten months ended in October last the export of dyes reached a total value of $12,500,000, and we are indebted to the United States for colors which up to now are not produced in this country."

Dicks David Co., Inc., with sales headquarters located at 302 Broadway, New York, announce that they are now in a position to offer a new color that should prove of much interest to the textile mills of this country.

Fred Wetzel Co., Inc., now located in a handsome suite of offices in Grand Central Terminal, report that within a short time they will have two new colors to offer the textile trade.

An Inquiry for Green Aniline Crystals

We will appreciate information in answer to the following letter.

"Gentlemen:

"Will you be kind enough to furnish us with the names of some aniline color manufacturers, who make the brilliant green Aniline crystal? We are having some difficulty in obtaining this article."

INQUIRY DEPARTMENT

In the establishment of this department it is our desire to help the consumer in buying his products direct from the manufacturer or reliable dealer. Accordingly all questions relative to source of supply will be answered to the best of our ability in an impartial way.

Furthermore, we propose to help in any difficulties that consumers may be having with dyes and chemical products providing that questions do not involve simply tests, which can be readily obtained from those who specialize in such work.

We hope that the consumer will not hesitate in making use of the department, for all questions relative to processes, etc., will receive the personal attention of a chemist who is fully qualified to handle the subject.

Dyes for Lacquers

Question: What kind of dyes can be used for making lacquers for electric light globes that will be fast to light?

Answer: The transparent lacquers are made by dissolving spirit-soluble dyes in alcohol and adding them to solutions of collodion and gums in Amyl Acetate or other solvent. Such colors

are never fast to light and fade very soon. All the so-called fast lacquers are now made by using insoluble color lakes. The best lakes are the transparent variety, not the opaque ones precipitated on blanc fixe. Even these are not as fast as they should be, but by the use of better dyes it is possible to make still further improvements.

Sap Brown

Question: What is Sap Brown?

Answer: Sap Brown is a dyestuff formerly used in large quantities by paper makers. It was imported in small lumps (called crystals) like Nigrosine and sold, before the war, for $40 to $50 per ton. It is said to have been made from the deposit known as Cologne earth, a fossil vegetable matter. Processes have been developed for making it in this country but have never been put into practical operation. The color can be set with alum and is very fast to light. It was chiefly used for brown wrapping paper, cardboard, etc.

Application of Fur Blacks

Question: How are the Fur Blacks or Ursols applied?

Answer: It is first necessary to have the skins tanned or tawed. Alum tawing is sensitive to dampness, but a one-bath chrome tannage is permanent. The fur is then scoured and treated with blacking lime and acid in weak solution. This makes the fur more receptive of the dye and give a more even shade. The dye is dissolved in the proportion of about 2 oz. to the gallon and the fur immersed for an hour at 120° F. The solution is then squeezed out and the skin hung in the air in a warm, moist place for an hour or two. This oxidizes and darkens the color but a final oxidation is advisable. For the better grades of goods Hydrogen Peroxide is used, but for cheap work Sodium Bichromate solution may be used. After oxidation, which takes place in a few minutes, the fur is washed and finished. After dyeing the softening of the skin is the work of a practical furrier.

The Term "Fast to Light"

Question: A certain dye was claimed to be fast to light, but a customer said it was not up to his requirements. How can it be decided who was right?

Answer: The term "fast to light" is not a definite term when applied to dyed fabrics. There is no dyestuff known which has absolute fastness to light. Neither has there been any standard established which will give the term a more exact value. Several weeks ago we published a short article on this subject to which we refer you.

At present our only measure must be a comparison of the unknown with a known color. We cannot well compare a pale shade with a full shade or misleading results will follow. A dyeing of four or five per cent. of Naphthol Yellow will seem to match a half per cent. dyeing of Tartrazine at first glance, but will be found to stand an exposure to light better than the Tartrazine, although the Tartrazine is actually faster than Naphthol Yellow. The whole subject is still quite complicated and causes many disputes. Probably the only way a comparison can be made intelligently is to use the dyes separately in two combinations that match the same shade. The exposure of these two matched shades will show whether they fade evenly, and only become lighter, or whether there is an alteration of the tone. Any color combination is better when all the colors fade alike, but the presence of one very fast color is as bad as the presence of a very fugitive one, as a change of shade is more objectionable than a mere lightening of the color.

At present fastness to light may be tested under the Ultra Violet exposure. While the change of shade is not identical with sunlight, it is very good for comparisons and measurements.

(*Continued on page* 12)

The Johnson Chemical Co., of Raleigh, N. C., has recently been incorporated with a total capital of $200,000.00. This company intends to engage in the manufacture of chemicals and allied products. The incorporators are J. I. Johnson, John W. Cross.

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MYRON DREW REESER, Managing Editor

Learning The Art of Dyeing

Many requests have come to us lately asking for the names of books on dyeing and coloring operations in general. We have not been able to conscientiously recommend any book for several reasons which it may be worth while to enumerate. Before the war the most up to date book was several years behind the progress in dyestuffs. Sulphur dyes were treated as an innovation, afterchrome dyes practically overlooked, developed colors regarded as too complex for consideration, and vat dyes looked on as impractical curiosities. It is a well known fact that technical books seldom include anything that is not ten years old, while the live facts and practical working methods do not get into print until they are almost obsolete.

At the same time there was a steady production of high class technical matter, in the form of sample cards and instruction books, published and distributed gratis by the large German factories.

Naturally each of these featured the products of one firm only, but there was much in common. The practical dyers and color users all have at present valuable collections of such books which money could hardly buy to-day.

To keep the trade informed was considered a necessary part of the propaganda, and it must have been a considerable item of expense. Many of the sample cards and books which were sent out broadcast at the rate of several hundred each month to each consumer could not have been duplicated in America for several dollars each.

We have seen cards devoted to the coloring of vegetable ivory buttons, others for soap, candies, fancy papers, paints, special cloths and yarns, in fact any material whose coloring might be done with any particular class of dyes.

This is hardly practical at present and will not be until one factory or group of American factories produces a complete line of dyes in any one class.

For the same reason it is not possible for any technical writer to produce a comprehensive book for the use of the consumer in general. It would be impossible to give a recipe for dyeing any material until the available dyes were obtainable in constant strength and shade. It would be equally absurd to give recipes that called for the use of certain American products and then have to add "In order to shade these colors we must use Acid Blue X, of which some may be left from old German stocks." The time will soon come when we will have many of the missing members, but it will be a long time after that before we can expect any issues of instruction books or the comprehensive "American Manual of Dyeing."

In the meantime what can we expect?

Permit us here to remind every user of dyes in all the industries that it was to fill this very need that the American Dyestuff Reporter was created.

To accomplish this end to the best advantage of all several things are necessary. The manufacturers should keep us posted regarding all new products and, if they give them new names, inform us of their properties. We can then inform the consumer of the new dye and its possibilities.

It is advisable for the consumers to let us know their needs and we can then put their case before the manufacturers.

The possibilities of this publication are enormous providing the right kind of cooperation is secured. We are making progress toward this end and each week marks another step forward. We are leaving the scientific discussions to the monthly papers and the markets to the dailies, but aim each week to give the practical side of the dye industry to those who will be most benefitted thereby.

What the Consumer Thinks

(Continued from last week)

Nashua Woolen Mills, Nashua, Ia.:
"A protective tariff that would give American dye manufacturers a reasonable profit."

Tell City Woolen Mills, Tell City, Ind.:
"Protective tariff in American dyes."

W. F. Robertson & Co., Honesdale, N. H.:
"Tariff by all means."

Valley Carpet Mfg. Co., Shippensburg, Pa.:
"Up to the present time we have not found in price and quality a substitute to take the place of German dyes. When we do, put duty on imports of German dyes."

January & Wood Co., Maysville, Ky.:
"A fair tariff would protect manufacturers and also the user of dyes, in other words not give the manufacturers a monopoly."

Bryant Paper Co., Kalamazoo, Mich.:
"Sufficient to protect home industry."

Modern Central Silk Dyeing & Finishing Co., Paterson, N. J.:
"Yes, we must advocate a protective tariff."

The Raleigh Woolen Mills, Fitzpatrick, W. Va.:
"High tariff protects home industry."

L. R. Day, Cleveland, O.:
"Tariff for protection only in order to enable the American chemist to compete with perfect dyes."

Revolution Cotton Mills, Greensboro, S. C.:
"A reasonable protection."

Barrow County Cotton Mills, Winder, Ga.:
"Enough tariff to protect our home capital. Let it be what it will."

Knight Woolen Mills, Provo, Utah.:
"Enough protection to enable manufacturers in this country to live and prosper after the war."

Griffin Mfg. Co., Griffin, Ga.:
"Enough tariff to insure continuance of the industry only."

J. W. Williamson Co., Wilmington, N. C.:
"Protection enough to allow a legitimate profit, but not so much as to keep out competition."

Faribault Woolen Mills Co., Faribault, Minn.:
"Full protection against foreign competition."

Muncy Woolen Mfg. Co., Muncy, Pa.:
"Sufficient tariff to protect the parties who invest."

The Wallace Wall Paper Co., Cortland, N. Y.:
"A tariff—enough to protect and develop the industry in this country."

Paragon Worsted Co., Providence, R. I.:
"Advocate a protective tariff to allow the manufacturer to grow. How much is needed to protect will quickly be proven by the growth of the industry."

Hollingsworth & Vose Co., E. Walpole, Mass.:
"Prohibitive tariff on foreign dyes."

Peerless Woolen Mills, Rossville, Ga.:
"Reasonable tariff."

Wm. Crabtree & Sons, Montgomery, N. Y.:
"Sufficient duties to enable the domestic industry to go ahead with productive and research work."

Lebanon Woolen Mills, Lebanon, Tenn.:
"We must have a sufficiently high and protective tariff to establish this infant industry."

The Interwoven Mills, Inc., Martinsburg, W. Va.:
"Minimum tariff only."

Defiance Paper Co., Niagara Falls, N. Y.:
"High protective tariff."

Jennings Lace Works Corp., Brooklyn, N. Y.:
"High tariff."

Brainerd & Armstrong Co., New London, Conn.:
"High enough for four years after the war."

Southern Embroidery Co., Baltimore, Md.:
"High enough to keep out German dyes."

Price Bros. & Co., Kenogami, Prov. Que., Canada:
"Dyestuff manufacturers should certainly be protected for the reason they have invested a large amount of capital. I do not feel qualified to outline the methods to be used."

Nonotuck Silk Co., Florence, Mass.:
"A sufficient tariff should, in our opinion, be placed on dyestuffs to protect capital which is engaged in the manufacture of dyes in this country."

Holden Woolen Co., Holden, Mass.:
"Protect the American manufacturer even though mills have to pay more for their dyestuffs."

Esterly Woolen Co., Esterly, Pa.:
"A tariff high enough to make American products entirely secure."

International Mfg. Co., Paterson, N. J.:
"Such as to prevent flooding the market with cheap dyes after the war."

Neversink Dyeing Co., Inc., Reading, Pa.:
"Medium tariff."

A. G. Dewey Co., Quechee, Vt.:
"Tariff enough to protect American manufacturers by taxing enough to offset difference in wages between Germany and the United States."

Holyoke Plush Co., Holyoke, Mass.:
"Protect the American industries well against foreign manufacturers."

Virginia Woolen Co., Winchester, Va.:
"Protect domestic industries reasonably."

Tonawanda Board & Paper Co., Tonawanda, N. Y.:
"As a consumer of dyes, we still believe in reasonable protection to American manufacturers by means of tariff."

M. & W. H. Nixon Paper Co., Manayunk, Phila., Pa.:
"Sufficient to foster domestic manufacture by the barring out of foreign dyes permanently."

Bay State Thread Works, Springfield, Mass.:
"'Made in America' should be here to stay. Tariff high enough to protect, law enough to have fair competition."

Orono Pulp & Paper Co., Bangor, Me.:
"Favor a high protective tariff."

Frankford Hosiery Mills Co., Frankford, Phila., Pa.:
"We believe the industry should be protected."

Pilot Cotton Mills Co., Raleigh, N. C.:
"Just enough duty to be sure of keep-

ing all German dyes out which we can make."

Tipton Cotton Mills, Covington, Tenn.:
"A tariff high enough to prevent strangling of American industry until well established, and then free trade."

American Thread Co., Willimantic, Conn.:
"Sufficient tariff to cover the difference in labor cost between the U. S. and Germany."

Crown Willamette Paper Co., Camas, Wash.:
"We consider a protective tariff on American made dyestuffs necessary to protect this industry at normal times."

Independent Silk Dyeing Co., Inc., Farmingdale, L. I.:
"Protection to enable competition against Europe."

Chicago Varnish Co., Chicago, Ill.:
"Ten per cent ad valorem."

Wolf River Paper & Fiber Co., Shamana, Wis.:
"We believe they should have ample protection."

Whiting Plorer Paper Co., Stevens Point, Wis.:
"At least twenty-five per cent."

Cheshire Mills, Harrisville, N. H.:
"Moderate protection."

G. R. Whiting, Franklin, Mass.:
"They should be protected so as to keep out foreign competition."

Everett Pulp & Paper Co., Everett, Wash.:
"With reference to protective tariff we should have the tariff high enough to protect our industries, and what it should be should be ascertained carefully and the tariff fixed on this basis so that after the end of the war our American factories will be able to compete with foreign producers."

Davis & Quick, Brooklyn, N. Y.
"No protective tariff."

Brightwood Mfg. Co., North Andover, Mass.:
"The tariff recommended by the American Chemical Society."

Hammermill Paper Co., Erie, Pa.:
"Full and complete protection."

Bellingham Woolen Co., N. Bellingham, Mass.:
"Fair protection to take care of difference in cost of manufacture only."

Creditors of Madero Bros. Meet

The creditors of the bankrupt Madero Bros., Inc., exporters and importers of drugs and chemicals whose business has been in the hands of receivers since Feb. 18, will meet at the office of the referee, Seaman Miller, 2 Rector Street, on Friday, April 12, at 11 o'clock, to prove their claims and choose a trustee to look after their interests. In view of the contest between two rival committees of creditors which are trying to obtain control of a majority of the claims, the meeting is expected to be a lively one.

Tonko L. Milic, former general manager of the firm, is still in the Tombs, pending his arraignment before U. S. Commissioner Hitchcock for attempting to ship salicylic acid in place of quinine sulphate to an Italian hospital. After many postponements, the case was to have been heard last Thursday, but was again postponed.

Inquiry Department

(*Continued from page 7*)

American Made Eosine

Question: What field is there for the sale of an American Eosine?

Answer: As a dyestuff this product is confined to the silk dyers who however prefer Phloxine or Rhodamine. Some paper mills use a limited amount. Red writing inks are made of Eosine but this use demands only small amounts. Cotton may be dyed pink on an oil and alumina mordant or lead mordant, the dyed yarn being mostly used for wrapping twines. The principal use however is in the production of red lakes for paints, wall paper, and printing inks. By varying the base on which the lake is precipitated a variety of scarlet pigments of rich tone are possible. Red lead, Blanc fixe and Barytes are used for heavy lakes and Alumina for light ones. Lead Acetate or Nitrate is always used as the precipitant. Under certain conditions a red with a bronze reflection can be made, but this requires a very pure product and careful manipulation.

Indigotine and Indigo Extract

Question: Please give me what information you can regarding Indigotine and Indigo Extract, fastness, uses, etc.

Answer: Indigotine and Indigo Extract also Indigo Carmine are simplex Indigo-di-sulphoric acid, generally the sodium salt. The pasty extract is mostly acid while the powders are neutral. The ultimate coloring matter is the same however. The dyestuff may be regarded as a level dyeing medium bright acid blue of moderate fastness to light and washing. There is a slight difference between the products from natural and synthetic Indigo. The natural is a trifle duller in shade but exhausts more slowly and dyes more evenly while the brighter blue from synthetic Indigo exhausts more quickly and is more likely to dye streaky if care is not taken. This is a dye highly esteemed by wool dyers for carpet yarns and dress goods and represents at present our only available bright acid blue of American manufacture.

Prussian Blue on Cotton Wool and Silk

Question: Can Soluble Prussian Blue be applied to cotton, wool or silk as a dyestuff?

Answer: A solution of this blue slowly heated may cause a tint that resembles a dyeing but it has no practical value. An old method produced Prussian Blue on the fibre by first making Iron Buff, by the use of Iron Liquor, and afterward working in a fresh bath of Yellow Prussiate of Potash. Even produced in this way the goods felt harsh and rough and were quickly decolorized by soap and alkalies. The fastness to light being excellent the principal use was for awning stripes and such goods as are seldom washed.

The principal use of this coloring matter, for it can hardly be called a dye, is for household laundry blues and for paper tinting. It is also an excellent addition to writing inks being unaffected by acids, iron salts or tannins.

Sulphoncyanines on Wool

Question: What is the best way to dye Sulphoncyanines on Wool?

Answer: The dyes of this class, being intermediate in character between direct and acid dyes, have an affinity for wool fibre in a perectly neutral bath. The dyeing proceeds more regularly if nothing is added to the bath except dyestuff. The temperature is raised to a boil and, as the boiling continues, the greater part of the dye is taken up evenly. The fact of the dye being taken up by the wool does not insure fastness so it is better to finish with Acetic Acid and Glauber Salt. Most dyes of this class work well with Acetate of Ammonia and with all three chrome processes—chrome mordant, after chrome and mono-chrome. Various members of this group are used in conjunction with Union dyes to correct the shade of the wool as they dye this fibre only, from a boiling neutral bath. The greatest objection to the entire series is the difficulty in obtaining level dyeings, but this is generally due to the use of a wrong process.

The Indigo Crop of India

The output of natural indigo in India is followed with close interest in these days. It is a source of general regret that the crop for 1917-18 promises to be materially below that of 1916-17. The following is the official report on the subject:

The total area sown is estimated at 617,100 acres, which is approximately the same as the revised estimate at the corresponding date of last year. As compared with the final estimate of last year (756,400 acres), the present estimate shows a decrease of 18 per cent.

The total yield of dye is now roughly estimated at 3,850 short tons, as against 4,125 tons estimated at this time last year, or a decrease of 6.5 per cent. As compared with the final estimate of last year (5,225 tons) the present estimate shows a decrease of 26 per cent.

Weather conditions at sowing time were favorable, and an extended area was sown with the crop, except in the Madras Deccan, where failure of rains, combined with a fall in prices, curtailed the area to such an extent as to counterbalance the increase in all other provinces. The crop has been adversely affected by excessive rain and floods in Bihar, the Punjab, and the western districts of the United Provinces. Elsewhere the condition of the crop is reported to be good.

Use of Sea-Weed for Dyeing

H. H. Kelsey of London, Eng., assignor to N. Malcolmson of London (Am. Pat. 1,254,810, of Jan. 29, 1918), finds that sea weed can be used much more extensively in dyeing than has hitherto been the case. To a slight extent dulse (*Rhodymenia edulis*) has been employed to produce a somewhat fugitive reddish dye, but it is the only instance on record.

The following is quoted from the patent:

Pigments of various colors are contained in sea-weed of the melanosperm, rhodosperm and chlorosperm groups.

Certain colors are remarkably constant in large natural algæ groups. Thus the *Fucaceæ* exhibit a brown or olive color, and the *Florideæ a beautiful rose-red.*

The present invention comprises a process of dyeing by means of dyestuffs produced from the melanosperm, rhodosperm and chlorosperm groups of sea-weed.

Colors may be imported to fabrics by merely boiling the particular sea-weed proposed to be used, with the fabric to be dyed; for example from one ounce upward of the weed to a pound of the fabric to be dyed.

The process of dyeing consists in placing the material that is to be dyed into a bath of water or spirit containing, either in the raw state or in paste or powder form, a sea-weed of the rhodosperm group (except dulse) or the chlorosperm group, or the melanosperm group (except *Laminaria* in the case when laminaria powder is contained in a paste with indigo).

The paste or powder can be obtained by subjecting the sea-weed to a treatment of boiling in water till it becomes soft, and next crushing it so that a paste results, or by roasting the sea-weed and then grinding the dry weed, much in the same way as coffee and chicory are roasted and ground. The powder may also be obtained by drying a paste.

When using the paste or powder the color is imparted to the fabric in much less time than when the raw weed is employed.

It is found that when using the melanosperm or chlorosperm or rhodosperm powder or paste or a dyeing liquid derived from any of these groups of sea-weed, the addition to the dyebath of a sulphuric-acid solution intensifies and deepens the color produced on the fabric. As an example 1 ounce of powder and 1 ounce of concentrated sulfuric acid mixed with 8 pints of water makes a good dyeing-liquid.

The colors imparted to the fabric from these sea-weed dyes are fast colors and do not necessarily involve the use of mordants.

Various known dyestuffs, mordants, or topping baths may be used, either separately or mixed with the sea-weed, powder or paste or their solutions, for the purpose of varying, intensifying or fixing any of the colors, if desired.

Different types of weed, or the colors obtained therefrom, can be mixed, to obtain varying shades and tints.

Notice to Subscribers

Owing to the disturbance caused by war conditions in the postal service, we cannot guarantee prompt delivery of this journal through the mails. For delays in such delivery, while they should be reported at once to this office, we cannot accept blame.

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 2 New York, April 22, 1918 No. 12

Educational Value of the Textile Exhibition

THE forthcoming National Textile Exhibition which is to be held at the Grand Central Palace, New York City, April 29th to May 11th, inclusive, should be of great interest to the layman as well as mill man. It will show the practicability of American machinery and illustrate the keen inventive ability of American chemists.

Each individual booth will be decorated with appropriate posters advising the use of American-made articles and products. Among those exhibiting are manufacturers of machinery, mill supplies, finished goods, government exhibits, dyestuffs and chemicals.

It is natural that the interest of readers of the REPORTER should centre on the exhibits of dyestuffs. We might say here that this is not to be a display of dyestuffs shown only in handsome jars. We certainly had enough of this practice in previous shows. To-day the mill man as well as the layman "has to be shown."

We are indeed glad to see that the larger manufacturers of dyestuffs are planning to demonstrate the actual application of their dyes to different fabrics. This demonstration will perhaps not interest the dyers as much as it will the women who attend.

After all, it is the women of America that control the commercial possibilities of many enterprises.

To-day, as we all know, the average woman looks upon American-made dyes as only substitutes. After the exhibition it is to be hoped that this opinion will change.

Then, when a store salesman (if such we may call him) tells her that American dyes are not as good as German, she can reply with a proper rebuke.

Mention of women brings us to the subject of the Fashion Show. This is to be a real feature indeed. Not the wax figures that one is accustomed to see in the show windows, but on the contrary, very *much* to the contrary, they will be live models. Twenty-five live models wearing the latest creations in gowns and evening wraps. The garments shown will be built from fabrics now placed upon the market by exhibitors.

We mention the Fashion Show in connection with the dyestuff exhibit because they are naturally interlocked. This can be readily seen when we realize that the garments are highly colored and the dyes used were made in America.

Manufacturers of dyestuffs should grasp this opportunity for, unquestionably, this is the physiological moment to interest women.

Every dyestuff manufacturer and dyestuff consumer should seize this opportunity to prove to all that the indus-

try is established. No better illustration could be furnished than will be shown by the fabrics worn in the Fashion Show. The women of America must be shown by comparison that American-made dyes are equal to the German. Where there is a Fashion Show there also are the women, and dyestuff manufacturers should realize this and act upon it to their advantage.

The publishers of the AMERICAN DYESTUFF REPORTER will have a booth at the Exhibit, and we assure our readers that we intend to do our share in making known to all the accomplishments of the industry.

Our booth will be open to our many friends in the trade and we hope they will take advantage of it.

We also place at the disposal of our readers the suite of offices of the Hewitt Publishing Corporation.

As publishers of the REPORTER we are in a position to give an unbiased opinion upon important subjects, and this information is at your command.

We hope to have the pleasure of meeting face to face those of you that we have come to know through correspondence and we look forward to this with eager anticipation.

After all, the future of the industry is dependent upon cooperation of all, and to this end the REPORTER is consummated.

The finished-goods department is new to the Textile Exhibition. It will cover an entire floor, and many of the large manufacturers of cotton, woolen, silk fabrics and knit goods will have exhibits. Although this department was not announced until a short time ago, the finished-goods manufacturers and jobbers have responded most enthusiastically. This phase of the exposition will serve to bring together the selling agents and men of all other branches of the industry. To the finished-goods man the exposition will be educational in the extreme, as many hundreds of buyers will attend the show. It is a fact that but few of these buyers of garments have ever been inside a textile mill, and they have but little idea of the processes of manufacture.

The United States Government has shown enthusiasm over the Exposition. The War Department, Navy Department, Department of Agriculture, and the Bureau of Foreign and Domestic Commerce have made arrangements to exhibit. In fact, the United States Government exhibits will cover a greater amount of space than those of any individual exhibitor in the show. It will not only be of interest to everyone in the textile industry, but will be interesting and instructive to the public in general.

The Quartermaster Corps will stage a most complete exhibit of all textiles used in the personal equipment of American soldiers, as well as tenting and woven materials required by the army. Tents actually set up and equipped in military fashion, as for official inspection, with a detail of uniformed men in attendance, will make the exhibit realistic as well as educational. Lay figures completely dressed in regulation uniforms and undergarments, with full equipment, will enable the visiting manufacturer of textiles and the maker of finished clothing to understand the minute requirements of the army.

In addition to the central exhibit, there will be special displays of cotton goods, woolens, manufactured articles, shoes and leather. Qualified representatives will be present to explain government requirements, and it is expected that many manufacturers whose business has been affected by war conditions will find here an opportunity to turn their factories to profitable and necessary government work.

Foreign wearing apparel that the government has spent years in collecting from all parts of the world will be shown by the Bureau of Foreign and Domestic Commerce. Lay figures will be garbed in the apparel of the various nations, and each garment will bear the regulation government tag giving full data concerning the place of manufacture, wholesale and retail price, nature of demand, import duties, and other pertinent information of value to manufacturers desiring to extend their business to foreign lands. The showing of ladies' lingerie—especially the rare and

valuable collection from South America—will be of particular interest.

A complete set of government standards for grade and color of cotton will be shown by the Department of Agriculture,which will also furnish ten reels of motion pictures showing the cotton industry from the planting to the finished goods. Similar movies of the woolen industry will be furnished if available during the show. Several reels showing the activities of the Department of Commerce have also been promised.

Arrangements are under way to secure from the Navy Department a complete exhibit similar to that of the army, and the complete equipment of naval and marine personnel will be shown. Negotiations are also pending with the Signal Corps, which includes the aviation and balloon sections, and those articles of textile interest—such as balloon cloth—which are not of necessity of secret nature, will probably be secured for the show.

Taken in its entirety the exhibition should prove highly educational and unquestionably the dyestuff exhibitors will receive their share of attention.

We hope that you will find the time in which to attend,—that you will be pleased with the exhibit and, most of all, that you will visit the booth of the AMERICAN DYESTUFF REPORTER.

Coal-Tar Products

The market for coal-tar products was particularly quiet this week. Prices on the crudes were somewhat easier due to the more liberal offerings and the light falling off in demand.

Toluol

It is with thankfulness that we report that large quantities of toluol have recently been released by the governmental authorities. The government, however, appears determined not to permit offerings on the open market. There are some dealers that are offering small quantities from time to time but this is of little interest to the actual manufacturers of dyestuffs.

Aniline Oil

There has been quite an active demand this week and a number of second-hand lots have been available at a slight concession in price. The producers of this product seem to be quite firm in the matter of price.

Heavy Chemical

The feature of the market this week has been the recovery of the price in caustic soda. Aside from this movement the market has been rather quiet with the exception of a little activity on the part of some of the smaller dealers.

The Central Dyestuff & Chemical Company, Plum Point Lane, Newark, New Jersey, is having plans prepared for the construction of a new reinforced-concrete addition to its plant. Marshall N. Shoemaker, 810 Broad Street, Newark, is architect.

Dyestuffs for Hat Dyeing

Hats being made of wool or fur, and the fur generally being "carroted" and the wool acid-fulled, introduce other difficulties that are not only dependent on the density of the fabric.

The general rules of wool dyeing require considerable modification in order to insure evenness and penetration. Before the dyeing is commenced the bodies should be well washed in a mild alkali to remove any traces of acid, if any has been used in preparing the felt.

The dye-bath is generally much more concentrated than for other kinds of wool dyeing, there being a much larger amount of Glauber Salt and usually much more dye than is really needed. At the start the bath contains only Glauber Salt and dyestuff and the boiling is continued for an hour or longer until the dye solution has penetrated through to the centre. This makes it necessary to use acid dyes of the best solubility and levelling qualities. Such colors as Avo Blue, Patent Blue, Tanafuchsine SG, Orange II, Resorcin Yellow and others of like qualities were much in favor before the war. For blacks, the Naththol Blacks and Victoria Black were used for some work, particularly on soft felts and shaded with the acid colors previously named. Hard fur felts for derbies were generally dyed with Chrome Blacks, aftertreated.

When the penetration has been effected, acetic acid is added in small portions, and when almost all of the color has been taken up the bath may be exhausted with Sulphuric Acid. Some hat dyers prefer to use Acetate of Ammonia, which on boiling slowly liberates Acetic Acid on the fibre.

There has always been a difficulty in dying small samples as a test because it is very hard to obtain the same penetration as in practical work. When the penetration varies the shade will vary also.

The best rule to follow in offering dyes to hatters is to avoid those which have any tendency toward uneven dyeing or insolubility or exhaust quickly.

United Piece Dye Works Purchased by American Aniline Products Company

The plant of the United Piece Dye Works, formerly known as the Peerless Finishing Works, at Nyack, N. Y., occupying the entire block fronting in Railroad Avenue, Cedar Hill Avenue, Hudson and Florence Streets, about 300 feet from the Erie Ralroad tracks, and not far distant from the Hudson River, has been sold to the American Aniline Products Company, of Manhattan, by Joseph P. Day.

The plant consists of a number of modern buildings, containing 93,045 square feet of manufacturing space. All of the buildings are equipped with sprinkler system, steam heat, electric lights and elevators.

The property was held at $105,000. Rose & Paskus, attorneys, represented the United Piece Dye Works, and B. R. Armour the American Aniline Products Company, which, Mr. Armour states, will begin immediately to manufacture aniline colors for the Government.

American-Made Dyestuffs and the Hosiery and Underwear Trade

By Dr. Louis Joseph Matos

Reprinted from The Underwear & Hosiery Review

The hosiery and underwear trade, like other branches of the textile industry, was not exempt at the outbreak of the European War from the uncertainties of the dye situation, and considerable anxiety was experienced by those most interested as to how these difficulties were to be met and overcome.

The knit goods industry for many years has made extended use of a great number of dyestuffs, representing almost every chemical group. The most important dyestuff, if such it may be called, is aniline oil, and its derivative, aniline salt, both of which are used in immense quantities for the production of fast blacks upon cotton.

Next in importance are the diazotized and developed blacks, of which many tons were consumed annually, chiefly for stockings.

The Immedial or sulphur blacks were also consumed in very large quantities, and to such an extent, that the sulphur color dyeing industry could be safely regarded as a distinct branch of the trade. Not only were the dyes of this group used for blacks, but tans and other mode shades as well.

The diamine or direct dyeing colors were most extensively employed for tans and the wide range of other standard and mode shades.

Whether due to apprehension, or to a realization that the dyestuff supplies were being conserved in order that the stocks on hand in the mills or believed to have been in the warehouses of the importers, various expedients were resorted to, by dyers for the purpose of making the stocks last as long as possible. It is needless to review the efforts of the importers, their agents, and the technical men, cooperating with the mill men and their dyers; of the experiments that were tried out with strange and unknown dyewares with the hope of producing shades that would meet the requirements of the public.

It is difficult to properly present the thoughts of those who were vitally interested in their endeavors to supply at the time, those dyewares that were seemingly out of reach. After the war had progressed for several months, it became apparent to those most interested that the supply of dyestuffs formerly secured from Germany was becoming gradually less, until that time when all realized that the last consignment had been received and no more could be expected. In the meantime, our chemists were not idle. It became evident that something would have to be done in this country toward making a beginning at least of producing dyestuffs from our own raw materials upon a far larger scale than had heretofore been attempted. This, of itself, was no easy matter for the reason that, while many of the simpler dyestuffs demanded by the mills were of no great difficulty to produce, the Intermediates absolutey essential for their manufacture were extremely complicated and required plants for their fabrication of considerable magnitude. Color chem-

ists were not idle. Processes had to be devised, long series of experiments carried out, machinery designed and installed, until a point was reached when it could be said that a beginning had been made.

What saved the day for the hosiery trade in the beginning of the war, was the building of the large plant for the manufacture of aniline oil and aniline salt at Marcus Hook, Pa., now constituting one of the important units of the National Aniline and Chemical Co., Inc. Immediately upon the outbreak of hostilities, the men now prominent in the National Company advanced a half-million dollars with which to commence operations in what is now the most completely equipped aniline plant in existence. It was at this plant where the oil was produced that kept the textile mills going after the supply of imported goods ceased.

The output of aniline was rapidly increased during the first two years of the war, owing to the number of plants erected in different parts of the country to manufacture this product. Aniline is produced from benzol, but the supply of this raw material was by no means as plentiful as it should have been, and this led to the erection of a great number of benzol recovery works operated in conjunction with steel works. It should be remembered that benzol, as a raw material, is employed for other purposes than the manufacture of aniline. The sudden and great expansion of the munitions industry immediately called for apparently unlimited quantities of picric acid, an explosive which is manufactured indirectly from benzol. Certain other industries not related to the dyestuff industry also demanded carbolic acid in large quantities. All these factors materially influenced the supply of benzol for aniline. Happily, the benzol plants now in operation are capable of taking care of our several requirements for this one important item.

Another important raw material is naphthaline. Prior to the war it was largely imported for refining and remelting, to be ultimately sold in the forms of balls as tar camphor. When the over-seas supply was terminated, every possible domestic source of supply was exploited, with the result that we have now liberal quantities of naphthaline for conversion into a number of necessary and valuable dyestuffs intermediates.

It is proper to draw attention to the fact that the great majority of the naphthaline intermediates are chemically of complicated structure, and very difficult to manufacture. It was to the solving of these difficult problems looking to the production of the necessary intermediates that American dye chemists applied themselves. It has been a matter of slow, but steady progress, and the work is still advancing. It should be remembered that at the outbreak of the war, there were very few chemists in this country who were reasonably well acquainted with the manufacturing details as applied to those raw materials most urgently needed. While the chemistry of the processes involved was well understood, the factory problems had to be met and overcome, one by one.

Of particular interest to the hosiery trade is the production of aniline. The National Aniline and Chemical Co., Inc., at its Benzol Works, Marcus Hook, Pa., now has the largest and most completely equipped aniline plant in the world, which is capable of taking care of the requirements of every branch of the trade.

The development of the sulphur color industry in this country, at one time regarded as problematical, is now thoroughly established, and the quality of its output is esteemed by dyers most favorably. There are several establishments now in operation successfully producing sulphur colors, principally blacks, blues, and tans, large quantities of the latter kind of colors being employed for the production of khaki shades for military purposes.

The principal intermediate for the sulphur black industry is chlordinitrobenzol, the manufacture of which in the early days of the industry was regarded as being doubtful, but in due time its successful production was assured, thus

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MYRON DREW REESER, Managing Editor

Patriotism in the Dye Industry

The manufacture of dyes in this country has more than one objective. It is not only necessary to produce enough colors to keep our mills supplied and incidentally to make money for the dye producer but a foundation must be laid for future achievements and a present defense maintained against pro-German propaganda.

Who has not heard it said repeatedly that we can only go so far in this industry? Who has not heard it contradicted by the vehement reply that we can do anything we set out to do?

Of course we can, but unfortunately we are slow in doing it. Everyone who knows the full details of the development of dyes in Germany and America realizes that with an industry that took many years and much labor and capital to develop, we cannot hope to attain full efficiency in a year or two. On the other hand, there are dyes now made which have been made in this country for some time, and which we have a reasonable right to expect to be almost perfect, that disappoint us.

The consumer, who has every reason to expect uniform deliveries, will say that if he gets two lots from certain sources he is surprised if they agree in shade and strength. This is certainly not due to lack of ability or experience but rather to a policy modeled after the old railroad P. B. D. maxim.

Nothing can be so un-American at this time as carelessness in this direction. There are thousands who are only too eager to point out these shortcomings and use them as shining examples of what we cannot do. A few isolated cases would do little harm but when it reaches so high a figure it is bound to create in the public mind a desire for the return of the old "made in Germany" goods. No patriotic American wants the consumer to yearn for foreign goods. The consumer does not want to be given a rebate without question — he wants uniform American goods.

We have offered a solution and it has been given wide publicity. No American dye manufacturer can truthfully say that he is ignorant of the advantages of general *standardization of dyestuffs*. The subject could not well be misunderstood. It is not urged that any unreasonable restrictions be put on any manufacturer, large or small. It was only hoped that they would aim to follow a standard of their own making. Later, for purposes of the government and scientific interest, these separate standards might be defined and classified, but to-day, for the sake of the consumer and the reputation of America, let us take away from the parasite, that is in our midst, this material on which he feeds—our indifference.

There was a hope this would be accomplished at the time the Dyestuff Association was formed, but many said: "Wait, there are more important matters demanding attention." We are waiting and we are taking note of whatever opposition develops against this subject. We have no power to force the issue, that power lies in the hands of the manufacturers themselves. We can exert the prerogatives of a free press and sound a warning. The consumers expect action and duty to American ideals demands it. Making large profits at this time is not the whole duty of any manufacturer. The entire country is called upon to make its sacrifices for the general good, but a concession of this sort may hardly be called a sacrifice. There is no manufacturer who cannot decide what grade of goods he will be able to deliver in the future—that should be his standard. It is not requiring him to make a sacrifice if he is asked not to deliver sub-standard goods and charge standard prices. We look forward to

the elimination of this type as the industry develops, but feel that it is beneath the dignity of any firm, that intends to stay in the business, to imitate such practices.

We shall take pleasure in reporting from time to time any moves that are made in the right direction toward upholding the good name and high standard of American dyestuffs.

The St. Louis Coke & Chemical Company is planning for the erection of a large new plant, including a by-product coke oven and two blast furnaces, on a site comprising about 300 acres recently acquired, near Granite City, Ill. The property was purchased for a consideration said to be in the neighborhood of $200,000. The new works will engage in the manufacture of toluol, ammonia, naphtha, benzol, metallurgical and domestic coke, gas, etc., and the project is estimated to involve an expenditure of approximately $5,000,000. L. E. Fisher is vice-president and general manager.

INQUIRY DEPARTMENT

Money-Value Test

Question: Please explain the details of a money-value test and how I can have one made by outside parties without disclosing the actual cost of the goods.

Answer: The general principle of a money-value dye test is to have both samples dyed with the same value of dyestuff. Thus if one dye costs $1.00 per pound and another $1.50, we would dye the second one at 1 per cent., or at a cost of $1.50 per 100 pounds of material. The first would be dyed at 1½ per cent., so that the cost of dye for 100 pounds of material would also be $1.50. Then a comparison of the two dyeings would show directly which product gave the best color for the same cost of dyeing. It is not necessary to give the actual cost of the dye. In the case given the cost of the first dye may be stated as 2 and the second as 3 or 20-30, 40-60, 16-24 or any other figures that preserve the same ratio. The dye percentages must be the inverse of the price ratio in every case.

Sulphur Dye Receipts

Question: How can it be determined what is the best dyeing recipe for a Sulphur dye?

Answer: It has been found repeatedly that no amount of laboratory work will give the exact method which is best for a Sulphur dye. The only real guide is a practical dyeing. The quantity of Sodium Sulphide should be such that the dyestuff is entirely dissolved and reduced. Also it should be sufficient to keep the dye dissolved during the greater part of the dyeing operation. As the cotton comes into contact with the air it oxidizes the dye base that is loosely in union with the fibre, the dye becomes fixed and whatever was in the liquor also oxidizes and remains suspended for a time. The excess of Sulphide redissolves and reduces this and is itself converted into sulphate. If the Sodium Sulphide was a polysulphide (as is usually the case) there is a separation of Sulphur. As the separation of Sulphur leads to several bad effects, it is necessary to have sufficient Caustic Soda or Soda Ash to prevent the separation of free Sulphur. These conditions, together with the amount of Common Salt present, must be so adjusted that during the time of dying there will be a maximum of color permanently fixed on the fibre, rather than oxidized in the bath, and that there will not be an excess of sulphide to strip off the dye again. It can be readily seen that these proportions will be greatly influenced by the amount of liquor and the amount of contact with the air. A formula that had been worked out for one dyehouse would not be the best for another. Warps and pieces which are greatly exposed and which have short liquors require more sulphide and less salt. Circulating or vacuum dyeing machines call for less sulphide and less salt, while hosiery dyeing machines work best with a medium amount of sulphide and plenty of salt. No two Sulphur dyes have the same properties in every respect, and even the same dye varies according to the age of the lot. Lots fresh from the factory dissolve easier and need less sulphide while old lots give much trouble in dissolving and often show losses in shade and brilliancy. Some Sulphur dyes leave the dyebath ready for rinsing and drying but others only develop their full shade by being allowed to hang in a damp condition for an hour or so before rinsing. Others require boiling soap to develop the color. An after-treatment with Chrome and Bluestone may be applied to all Sulphur dyes and may be expected to redden and dull the original shade, at the same time to increase the fastness.

Direct Red and Acid Fastness

Question: In order for a Direct Red to be considered fast to acids what strength of acid should it be able to resist?

Answer: It will be necessary in every case to define the name of the acid rather than the strength. If a red is changed instantly by 10 per cent. Sulphuric Acid and shows no change with 2 per cent. Sulphuric Acid, it is only a matter of time. The weaker acid will

also change the color but will take longer to do it. When we use Sulphuric Acid of over 80 per cent. there is likely to be a carbonization of the fibre itself which might be mistaken for a color change. Acetic Acid turns Congo Red to a blue black even in the most dilute solutions but Glacial Acetic Acid, free from water, causes no darkening of the color until it absorbs moisture from the air. Benzo Purpurine, on the other hand, turns brownish and will not become blue with Acetic Acid but requires stronger acids to cause this change. In testing dyes for fastness to acids the question then is what acids it resists and which change the shade. As a rule, all organic acids act alike and all mineral acids, except nitric, act alike. Few, if any, dyes are fast to nitric acid but the changes it produces are of value for purposes of identification. Some dyes change but slightly under an acid test, and others change radically, but so far no rule has been made to define how great a change is permissible before a color is to be considered as not fast.

American-Made Dyestuffs and the Hosiery and Underwear Trade

(*Continued from page 7*)

paving the way for the manufacture of this most important series of dyes.

The National Aniline and Chemical Co., Inc., has concentrated special efforts upon the sulphur color group of dyes, the results being a range of products that enable the dyer to meet every requirement of the dyehouse, as well as the demands of fashion. This important group of dyes includes the following types, comprising the now well-known series of Ammaco colors, and others very closely related, viz.:

Ammaco Sulphur Black WB pdr.

Ammaco Sky Blue.

Ammaco Sulphur Blues D and DR.

Ammaco Sulphur Browns, of various shades and adapted to all purposes.

Ammaco Sulphur Khaki, of various shades. This series is regularly and widely employed for the production of khaki shades under various government contracts.

Ammaco Sulphur Green SAP, an olive green of good properties.

Ammaco Sulphur Yellows, of several desirable shades.

This particular group of dyes represents long continued labors of the research and manufacturing staffs, keeping constantly in mind the various exacting requirements of those branches of the textile industry that depend mainly upon the sulphur colors. The hosiery industry in particular, being a large user of browns, tans, etc., received especial attention.

Supplementing this series of dyes is a small group of closely related products, among which may be mentioned, as being of interest to hosiery dyers, the following:

Sulphur Black F Paste Cone.

Sulphur Black Superior, a product of the very highest concentration, and possessing great depth and brilliancy of shade.

The specialist in sulphur color dyeing has now at his command a line of strictly American products that permits the widest latitude as regards shades,

whether upon woven or knitted fabrics, or upon raw stock cotton intended for knitting or hosiery yarns.

The knit goods trade has always been a large consumer of sulphur colors and when the supply of this line of coloring matters was augmented by quotas of domestic production, an era of relief pervaded the trade. Chemists identified with the sulphur color dye industry in this country are carrying on their labors incessantly, and there is every reason to believe that from time to time, the hosiery trade will be apprised of additions to this important line of dyes.

In the group of direct dyeing colors, there are many whose special field of usefulness is found in the knit goods trade, and the research department of the National Aniline and Chemical Co. has the several problems of their production constantly before it.

The list of American-made direct dyeing colors produced by the National is even more extensive than the sulphur colors. Of first importance is the well-known Erie Black Gx00, a product possessing standard properties, and of wide application wherever a direct black can be used.

Ammaco Direct Blue 3B.
Niagara Blue 2B.
Niagara Blue DB.
Niagara Dark Blue 3R.

These comprise a series of blues that permit the production of a very wide range of shades, and adapted to various conditions of dyeing. The group of direct browns include Direct Brown T, a universal color for tan shades, and which can readily be toned with other of the National's products yielding an attractive range of mode shades on hosiery. Erie Direct Browns C and GR are two well-known types of general application to cotton.

The list of American made dyes of direct interest to the hosiery trade would not be complete without reference to a number of important, though less used colors, that find constant application in the knit goods dyehouse for a variety of purposes. These dyes are: Ammaco Direct Green WB, and Erie Direct Greens MT and WT; Erie Direct Orange 2R; Erie Direct Red 4B Conc; Erie Garnet B; Ammaco Delta Red 2B, and Buffalo Direct Garnet R.

Though a small group, it is comprehensive and of wide utility, not so much for the hosiery trade, but for sweaters and heavier lines. To this group may

be added the Ammaco Direct Violets, and Niagara Violet BW; Ammaco Chloramine Yellow WB; Buffalo Direct Yellow KM, and Niagara Fast Black F.

Like many of the dyes in other groups, some of these particular coloring matters are not easy to manufacture, but in due course these difficulties will be overcome, and the dye placed upon the market.

The American textile industry is so extensive, and covers such a wide range of fabrics, each fabric of the industry requiring groups of dyes peculiar to itself, that it seems almost incredible that so much progress has been made in keeping all these various industries going, within such a brief period, and with so little preparation.

New Dyes

We are now authorized to announce to the trade the dyestuffs listed below.

These dyes are manufactured by one of the large companies the name of which is indicated by the name of the products:

Niagara Orange Y

This is a recent addition to our list of direct dyeing colors, but which is of great importance for coloring various cloth as a self-color and in combination shades.

It dyes level, penetrates the fabric well and is to be recommended for its value in jig and pad work.

This dye is identical with its prototype and possesses all the useful properties of the heretofore important product.

Niagara Blue 3 B

This is a new addition to our list of direct dyeing colors. It is especially adapted for dyeing cotton piece goods on account of its level dyeing and penetrating properties, particularly on the jig. It discharges readily by the usual process yielding clear whites.

Niagara Blue 3 B is identical with several well-known brands of direct blues formerly imported, and will be found a useful addition to the list of dyes employed by the cotton dyer.

Superchrome Black

This is a new after-chroming wool black, possessing very good qualities of fastness to fulling, light, potting, acids and alkali, and should, therefore, prove to be of much interest to raw stock, yarn and piece goods dyes, for the production of blacks, or as a shading color in combination with either Chrome Navy Blue, B. N. Extra, and Buffalo Chrome Black B. N., yielding a wide range of fast shades of various tones.

Superchrome Black 6 B. P. is also valuable for the production of shades adopted to the vigoreux process.

Chemicals Used in Bleaching, Dyeing, and Calico Printing

This article appeared in the March issue of "The Textile American," and full credit is given this publication.

Nothing is of greater importance to the chemist, bleacher, dyer, and printer than an accurate knowledge of the varying properties of the numerous chemical agents, thickenings, etc., daily

employed in the carrying on of these industries; in fact, the same is absolutely essential to the best results being secured. Some chemicals exist which give unrivalled results but which cannot, owing to their cost, be extensively employed, new chemical agents are constantly making their appearance, and new preparations, also cheap substitutes for some of the costly chemicals just named which succeed admirably in producing the same results. The purpose of this article is to deal with the most important agents utilized to-day in bleaching, dyeing, and calico printing, describing their various properties fully, so that those engaged in the trades may be thoroughly up-to-date in their knowledge of them.

Hydrogen Peroxide, or Peroxide of Hydrogen, is often named in connection with the bleaching of silk as a substitute for stoving in sulphur. It is used as a colorless, aqueous solution, prepared by decomposing barium peroxide, or sometimes sodium peroxide with dilute sulphuric acid. The bleaching property of hydrogen peroxide is based on its property to readily develop oxygen. The strength of the commercial solution is generally expressed in volumes of oxygen evolved by 1 volume of the liquid, the usual strength of 12 volumes corresponding to 3% hydrogen peroxide. Pure hydrogen peroxide of 30% is at times sold under the name of "Perhydrol." Hydrogen peroxide is used for the bleaching of white yarns and fabrics. The product keeps best at a low temperature in the dark, and if acidulated with small quantities of acid. An addition of 1½ ounces napththalene, or 1 pint of alcohol, or ether to 10 gallons of the solution improves its stability. In the presence of alkalis, or on heating, it readily gives off the oxygen it contains, and as certain metals exercise a decomposing action upon hydrogen peroxide it is best to keep it in well-tarred casks, or in carboys.

For determining its strength, 2-4 grams of a sample are mixed with 20 c.c. sulphuric acid (diluted 1:2), and an excess of potassium iodide is added. After standing 5 minutes, the liberated iodine is titrated with thiosulphate, and starch solution. In the absence of other bodies which reduce permanganate the latter may be used very simply for the determination. A measured quantity of the sample is acidulated, and titrated with permanganate until the solution has assumed a permanent faint pink color; in this case oxalic acid is particularly to be considered, which is contained sometimes in the marketable peroxide of hydrogen, and which is recognizable by the property of its solution after neutralizing with ammonia, and again acidulating with acetic acid to yield a white precipitate with calcium chloride. Hydrofluoric acid behaves in a like manner but the precipitate does not reduce permangante.

Sodium Peroxide serves for bleaching in the same way as Hydrogen Peroxide. It is a white deliquescent powder which absorbs carbon dioxide with the evolution of oxygen. It dissolves in water with generation of heat and on boiling develops oxygen. On sufficiently cooling, it dissolves in acidulated water with formation of hydrogen peroxide and the corresponding salt. It is frequently used, therefore, in place of the latter for bleaching. When brought into contact with inflammable substances like paper, etc., it ignites them; therefore, it must be always handled with care. It develops 20 per cent. by weight of oxygen, whereas hydrogen peroxide of 12 per cent. by volume only yields 1½ per cent. by weight of oxygen. In addition, it should be well noted, sodium peroxide possesses the advantage of remaining stable for an indefinite period when properly stored. It is determined in the same manner as peroxide of hydrogen. Owing to its hygroscopical character it must be weighed off rapidly, introduced carefully into dilute sulphuric acid, any development of oxygen being avoided as far as possible, and titrated to best advantage by means of permanganate.

Grape Sugar, or Glucose, is produced, chiefly, by treating starch with acid, and is sold in white, or yellowish lumps, very easily soluble in water. When heated with alkalis, grape sugar

has a strong reducing action, and is for this reason largely employed in dyeing and colico printing. It serves as an assistant for printing immedial colors, and is also used for dyeing the immedial colors on wool, half-wool, or silk in order to protect animal fibre against the detrimental action of sodium sulphide. It is, in addition, employed to add to finishing sizes on account of its property of absorbing moisture.

Diastafor is a product much used of late in place of the ordinary extract of malt to liquify starch in removing the size and for other purposes. It is a thick liquid extract of malt of great purity and strong action. It is easily soluble in lukewarm water of a temperature not exceeding 50° C. (120° F.). Diastafor is applied generally at 40-70° C. (105-160° F.), but acts best at 60-70° C. (140-160° F.). Temperatures above 75° C. (167° F.) and likewise alkalis, destroy the diastase which is the active ferment of the Diastafor and so prevent its dissolving action on starch. The temperature of a liquor, or size on which the Diastafor is wished to act must therefore not exceed 75° C. (167° F.), and, further, they must not contain any alkalis. On the other hand, if the reaction of the Diastafor is to be interrupted, for example, when preparing thickening agents, finishing sizes or dressing, they must be heated rapidly, or alkali must be added. Diastafor serves very well for preparing alkaline starch thickenings.

Acetine is a mixture of the acetic acid ethers of glycerine, and acts very successfully as a solvent for Basic colors in calico printing. On steaming it dissociates into acetic acid and glycerine.

A product which is now used largely for finishing purposes, and in some instances as a thickener with very good results, is Carrageen, or Irish Moss. It is a glue-yielding plant (lichen sea weed), greenish white in color, transparent, conglomerated like horn, which dissolves almost completely in boiling water. Strong decoctions gelatinize. Carrageen is sometimes employed in yarn printing.

Iceland Moss is a lichen forming little hard grayish white, or olive green leaves which swell in water and form a gelatinous mass, and under the denomination of Lennar Gum (Vigoureux Gum), a kind of lichen in form of a yellowish powder is marketed, which is very well suited as a thickener or slubbing printing.

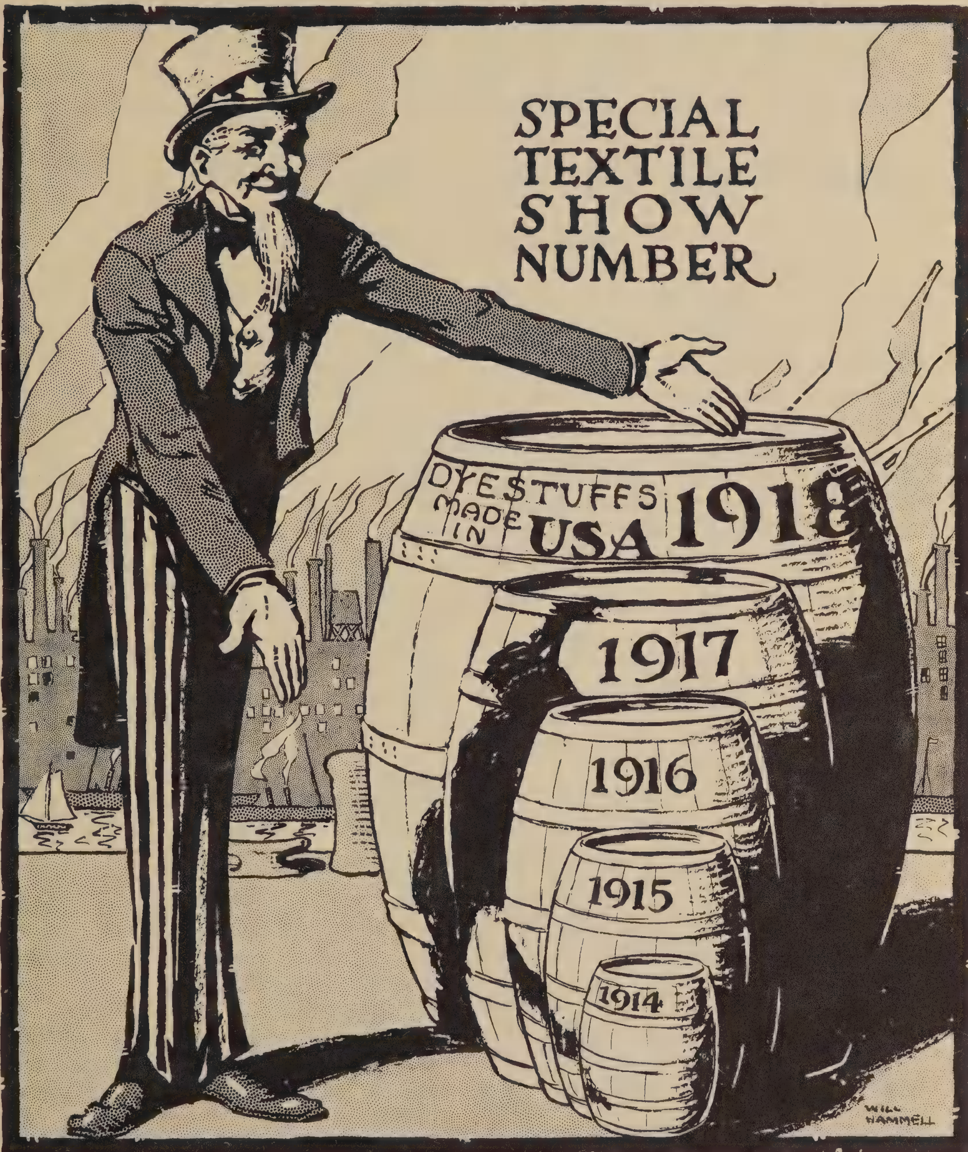
Blood albumen is employed principally as a thickener and answers very well for fixing earth colors, Diamine colors, and at times also Basic colors. To prevent the frothing of the albumen colors, some olive oil, turpentine oil or glycerine is added. The colors are usually printed with a brush furnisher as they are apt to stick in the engravings of the printing rollers. Blood albumen is sold in the form of bright yellow to brown scales, which are soluble in water at a temperature not exceeding 35° C. (95° F.). At about 70° C. (160° F.) it becomes insoluble, and coagulates. When cold, it coagulates by the action of mineral acids, metaphosphoric acid and certain metallic salts. With formaldehyde insoluble albumen compounds are likewise obtained. The lighter sorts of blood albumen are better to employ than the darker ones, particularly when printing light shades. The albumen solution is prepared by pouring 1-2 parts water of 30° C. (85° F.) over about 1 part albumen, allowing the mixture to stand for about 24 hours, and from time to time submerging the albumen swimming on the surface. The solution is then separated by sieving it off from the undissolved residue. To prevent the solutions from putrifying, a little arsenate of soda (1-2 per cent.), glycerine, etc., may be added. Dark colored qualities of blood albumen may be bleached by treating their solutions with turpentine oils.

The unpleasant odor attaching frequently to goods printed with albumen color can be removed by a slight chloring after the steaming.

Egg albumen is placed on the market in the form of pale yellow scales, and on account of its light color it is in certain instances preferred over blood albumen for delicate shades, notwithstanding its high price.

(*Continued in a later issue*)

AMERICAN DYESTUFF REPORTER



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The Production of Coal Tar Crudes in America

HOW CRUDES ARE RECOVERED FROM COKE OVEN GAS—THE INCREASING USE OF THE BY-PRODUCT COKE OVEN IN AMERICA

IN a general way, everyone connected with the textile industry in America knows that the manufacture of aniline dyes is dependent upon basic coal-tar products. In many cases, however, we have found that the relationship of the production of finished dyestuffs to the intermediate and basic materials from which they are produced and the manner in which the so-called crudes are obtained from coal, is but imperfectly understood. It would seem, therefore, that an elementary account of these fundamental processes, together with some outline of the possibilities for the manufacture of crudes and intermediates which exist in America, might prove interesting to readers of the REPORTER.

Practically all of the basic materials essential to the manufacture of aniline colors are by-products of the coking industry. The manufacture of coke from coal, as is very generally known, is a primary essential of the iron and steel industry of the country. In past years it was customary for coke to be made by independent companies and sold to the large iron and steel interests. At the present time, however, a great majority of the coke ovens of the country are owned and operated directly by the steel companies. The original American method of producing coke was in an oven which, by its nature, destroyed a great part of the by-products which have been for many years retained and put to valuable use by the more modern by-product ovens in general use in European countries.

INCREASING USE OF BY-PRODUCT COKE OVEN

AT the outbreak of the war, it is stated that only about 25 per cent. of the coke manufactured in America was produced in by-product ovens. Since the beginning of the war, however, because of the greatly increased domestic demand for these by-products and the inability to secure them from Central European countries, by-product ovens have been rapidly installed and to-day we believe that between 50 per cent. and 60 per cent. of American coke is produced in by-product ovens.

In a broad way, the by-products derived from the carbonization of coal into coke may be divided into five classes—ammonia, gas, light-oils, cyanogen and tar. With only two of these, namely gas and light-oils, is the dyestuff industry primarily concerned. It

is true that small quantities of products useful in the dyestuff industry are obtained from tar, but they are so small as to be safely disregarded for practical purposes.

The chief basics for the manufacture of dyestuffs are bensol and toluol. These products are generally classed with the light-oils altho, as a matter of fact, their recovery is obtained in greatest volume from the washing of the gas rather than from the tar itself. Coke oven gas may be profitably utilized for illuminating or fuel purposes but it is also possible to recover certain of its constituents without destroying its value for these purposes. Roughly speaking, the recovery of perhaps 2½ gallons of light-oil may be had from one ton of coal carbonized.

Benzol Recovery

CHIEF among the constituents of light-oil is benzol. Its recovery is a comparatively simple matter and is based upon the property of certain high-boiling oils to absorb the crude benzol vapors from the gas and to yield them up again when heated to a temperature below their own boiling point. The washing of oven gas with oil, for benzol, is practically parallel to the washing with water to recover ammonia, the guiding principle being to bring the gas into intimate contact with a maximum surface of the cool washing liquid. The benzol vapors, when released from the washing oil and condensed, contain from 10 to 15 per cent. toluol and from 45 to 55 per cent. benzol, with small amounts of xylol and naphthalene. From this crude light-oil the refined products are obtained by successive distillation. Benzol, in addition to furnishing raw material for a large portion of the chemical and dyestuff industry, is also an extremely practical motor fuel and can be readily used as a substitute for gasolene if an over-production in this country should develop.

Naphthalene, although chemically of an entirely different nature from benzol and toluol, is generally classed in the light-oil fraction and forms the crude material from which many important colors are derived.

Until the war demands for benzol and toluol arose, their uses in America were comparatively limited. Since the outbreak of the war, however, toluol, the base from which trinitrotoluol—the famous T.N.T.—is made, has, of course, been in tremendous demand and benzol has been in nearly equal demand for the manufacture of picric acid and aniline oil. This demand has, of course, been responsible for the steady

(*Continued on page* 19)

HOW THE DYESTUFFS CRISIS WAS MET

THE WORK OF AMERICAN SCIENCE, CAPITAL, AND INDUSTRY—WHY GERMANY CANNOT AGAIN CONTROL OUR COLORS—ONLY STAPLE SHADES AVAILABLE YET, BUT THE WHOLE SPECTRUM ON THE WAY

By ELLWOOD HENDRICK

(Author of "Everyman's Chemistry")

This article, which appeared originally in the World's Work for March, 1918, has been widely commented upon as being the most satisfactory summary of the development of our American Dyestuff Industry which has appeared up to date. We believe that readers of the Reporter will find it well worth reading.

IN 1915 the textile mills of the United States were about to close down for lack of dyes. There were more than 900 artificial dyestuffs in general use and the market was bare. The situation was serious. Agents of German houses could not import without returning cotton or copper or something needed by Germany for purposes of war, and that was not allowed. The situation was very like that of a farmer's wife who wants to bake a pie. She needs flour and lard and salt and eggs and, let us say, apples. Across the road is a field of wheat, back of the house is an apple orchard, there are pigs in the pen and chickens on the roost, but she has neither flour nor lard nor eggs nor apples. The United States, like the rest of the world, used to buy its colors ready-made, and it got them mostly from Germany. The native American coal-tar dyestuff industry was represented by the Schoellkopf Works in Buffalo, Heller & Merz in Newark, the W. Beckers Works in Brooklyn, and four smaller establishments, one of which was owned in Germany. The first three, despite the German names, were thoroughly American concerns, struggling along as best they could against hot competition from Germany—yet having to buy most of their materials from that country. Everything to make them of—to make the things that correspond to flour and eggs and lard and apples, if we are thinking of pie instead of dyestuff—was here in abundance. The Hudson River Works was purchased a number of years ago by the Bayer Co., of Elberfield, and so far as I am aware it is still owned in Germany. It had nearly ceased to make colors and was making drugs, as a more profitable enterprise.

In regard to intermediates, which are the coal-tar materials out of which dyes are made, the condition was interesting. The iron and steel industry had attained great proportions, but right here we meet the text of many sermons preached by scientific men before the war. American business men — not as individuals but as a great class—were not sufficiently hospitable to applied science. There was plenty of boasting but still more neglect. We find an example in the making of coke for blast furnaces. It was made mostly in bee-hive coke ovens in which all the gas, ammonia, and tar are destroyed. Only a small percentage was made in by-product coke ovens in which these are saved. It was very wasteful to destroy all these valuable products to make coke, but we have always been lavish in this country and are less distressed by the consciousness of waste than other peoples.

In 1909 three interested companies started the coal-tar intermediate industry. These were the Solvay interests

of Syracuse, which make soda and, through an allied corporation, build and operate by-product coke ovens; the Barret Co., which buys tar, refines it, makes roofing and other tar products —the so-called crudes—and the General Chemical Co., which is a large producer of acids, which are needed at every step. They knew that by-product ovens were sure to replace the bee-hive type in time, because of the saving of gas and the increasing value of gas fuel, and they organized the Benzol Products Co., secured competent management and began to make aniline oil at Frankford, Pa., making about 200,000 lbs. per month. This is merely one of a great many coal-tar intermediates, but it is largely used. The writer of this article had made aniline oil at Albany in 1883, but his company did not last. Dr. Jayne, the elder, of the Barret Co., had also undertaken to make it, but not for long. This new establishment, however, had such financial strenght back of it that the alarm was sounded in Germany and they flooded the American market with aniline at less than cost. It was a losing proposition, but the American owners stuck to it, while the Schoellkopf Works and Heller & Merz continued to buy and use the American product. Congress put a duty on aniline, but the Germans discounted the duty and continued to sell below cost. The fight was still on when the war broke loose. A great deal of aniline is used by textile mills for black dye. Before the war more than 12,000,000 lbs. were used annually, but the American mills generally used the German product.

THE SCIENCE OF DYEING

To get the dyestuff situation clear in our minds we must note another fact. Dyeing is an art, but it is also a science. "Don't talk about theories, give us practical men," has been the slogan of the American business man for many years—and yet theory is the basis of science. The textile industry participated in this attitude, despite the fact that there were far-sighted mill men who combated the anti-scientific

heresy and established such splendid institutions as the textile schools at Philadelphia and Lowell. The application of dyes to fibres in this country is still in transition from a trade to a professional calling. The agencies of German houses, some of which were American and some German-owned, gave service along with the goods they sold. They sent textile chemists around to the mills to teach the dyers how to work with their products and to get the best results. This established very close relations between many of them and the agents of German manufacturers. The relationship was made all the closer because in many mills there is not a chemically-trained man in the whole establishment. I am not speaking of the great, progressive manufacturing concerns whose works are models of efficiency, neverthless I am describing a vast number of American textile mills.

Then came the war, and in 1915 the strain was on. The market was bare. A few importers started in to manufacture in a small way, but to this day the main product is from American factories that have developed as we shall soon see. We were still in the position of the farmer's wife who wanted to make pie and had nothing nearer to her ingredients than a field of wheat and an apple orchard. Munitions had to be made and they call for coal-tar intermediates. Water-gas, so largely produced in this country, yields no tar, and tar products were needed in the worst possible way. So by-product coke ovens were substituted for the bee-hive type as fast as they could be built, and now about 50 per cent. of our coke is made by the modern process. The owners of the one concern that made intermediates plunged in and built for the future. This concern is now producing more aniline alone than was formerly used in the entire country. The Du Ponts, with their great research laboratory and chemical staff, became tremendous users of coal-tar products, and it goes without saying that their handling of these is competent and intelligent. The Merrimac Chemical Co. near Boston and the Newport Chemical Co. in Wisconsin began to make intermediates, and so did Marden, Orth & Hastings, and the Butterworth-Judson Co. of Newark.

A SERIOUS ECONOMIC QUESTION

In the meantime the dyestuff situation was desperate. Schoellkopf and Beckers were working three shifts and throwing back into extensions every penny of the big profits they made. The same may be said of Heller & Merz. Sherwin, Williams & Co., paint makers in Chicago, had to have certain colors for pigments and, as they could not buy them, they made them and are now producers. The big printing ink concern of Ault & Wiborg of Cincinnati could not buy, so they built and built well and are now producing. Dow of Michigan is already making indigo. Marden, Orth & Hasting of Newark are producing a considerable line. So is John Campbell and also the Butterworth-Judson Co. Herman A. Metz, formerly one of the leading importers, is manufacturing in two factories, and the Hudson River Works of the Bayer

Co. at Rensselaer, N. Y., has gone back to making some colors again. The brothers Blum of the United Piece Dye Works at Paterson needed some colors for silk which they could not procure, and now they are producing some for the market. The Arnold Print Works at North Adams, Mass., is making a few of the dyes that it needs. And there are a vast number of other makers, some putting out only one or two colors and others more. The Du Pont interests are building on a very large scale to make indigo and other colors. Much the largest producer of dyestuffs is the National Aniline & Chemical Co., Inc., which now includes the Schoellkopf Works of Buffalo, the W. Beckers Works of Brooklyn, the Standard Aniline Works at Wappingers Falls, N. Y., the Benzol Products Co. at Marcus Hook, Pa., and the research plants, for products specifically needed, of the General Chemical, Barrett, and Solvay companies, all of which are large shareholders. An interesting note in this connection is that a large participant in the Solvay companies at Syracuse is Ernest Solvay of Brussels, who saved that city by the payment of the great indemnity, said to be $6,000,000, to the German invaders to save that city from the fate of Lovain. Syracuse, N. Y., helped to save Brussels, Belgium.

Well, then, what is the situation today? Are American makers producing all the colors formerly obtained from Germany? Very emphatically they are not. Are those that they make as good as those made in Germany? Yes, the same thing is the same thing, no matter where it is made. The only qualification to this statement is that there has been, under slap-dash rush of work, an occasional lack of regularity of product, but among responsible makers this is well overcome. There is no serious defect in the quality of dyestuffs made by the best American makers. *The shortage is in variety.* Some colors are good for wool, others for cotton, others for silk, and others for two or more fabrics. Some are faster to light, others to washing, and some are not particularly fast but dye evenly, which is a great desideratum. Others are needed for the pure beauty of shade which they produce. There is no such thing as an absolutely fast color and there never has been, from Gothic times to ours. The greatest fastness in dyes to light, washing, and bleaching is found in certain products of coal tar.

THE REASONS FOR THE SHORTAGE

Now let us explain why the different varieties are not coming out more rapidly. Some are easy to make and there are little factories all over the country making them. When it ceases to pay they will stop business. Others are exceedingly difficult and involve eight, ten, a dozen or more processes, every one of which is of the greatest delicacy and is full of chemical tricks. Sometimes one product may be obtained, but as we advance in complexity there are two, three, and more different products resulting from one process. By what amounts to chemical chicanery—to use a bad word for good practices—we can increase the yield of one over the other

occasionally, but this has its limitations whether the process is carried out here or in Germany. Therefore, uses must be found for these by-products, or else the cost of the thing obtained is entirely too high. Some dyes imported before the war were not made because of their merits but rather to use up the by-products of some manufacturer. They were made in limited quantities and only brought high prices when some special use for them was found. There is a possibility that greater control in yields may be developed, and in the lines of thought that lead to such control American chemists are among the world's leaders.

What scientific men engaged in this pursuit like to do best is to work out new and improved colors; those that are lovelier in shade or faster to light or washing or that dye more evenly than any that are known. That is a line of effort at once pleasing and profitable. But conditions do not allow it. Mills must be supplied and the old colors must do until immediate problems are met.

Remember, please, that dyestuffs are not made by a "formula." In the case of a color very much needed but never made in America before, it must first be produced in the laboratory. Knowledge of what it is and even how to produce it is not enough; it must be produced so as to furnish an adequate yield. There may be half a dozen ways of making it, but the problem is to discover the best way—a way that is economical. When that is worked out the matter is turned over to the works and here again there is testing to be done, because the conditions of mass, pressure, temperature, surface, and whatnot are all different in the works from in the laboratory. When this is completed and factory methods are determined upon, it is very often necessary to set up special apparatus and new machinery which, under wartime conditions, is seldom to be obtained as soon as it is wanted.

And there are other difficulties. For example, to make the color that is wanted, bodies are required that cannot be produced alone, and if everything that is made is thrown away except that which is needed, the whole undertaking is unprofitable. So the problem of working up the products that appear on the side, as it were, is likely to be present, and the laboratory must find uses for them. The situation is something like that of a clothing merchant who is compelled to buy suits to meet a demand for trousers. The situation is met, time and again, but it stands in the way of haste.

A visit made by the writer to the research laboratory of one of the largest works showed how the subject is undertaken by American chemists today. Not only is there provision made for research in the manner provided in the great German works, but it is fair to say that they have gone even further in providing for research in pure science than has been undertaken anywhere in the manufacture of these products. These provisions are for the future and it is a fair guess that when the war is over and there is time to turn around and work for the fun of it, this country will be a leader

rather than a follower. In the greatest of American industrial research laboratories pure science goes hand in hand with that which is applied.

Now let us take a glance toward the future. Turkey red will be on the market early next year; so will hydron blue. The fast anthracene colors are coming along, but we must not be in too much of a hurry for them. Synthetic indigo is here in a small quantity and next year it will be available in large quantities. It is doubtful if the 10,000,000 pounds and more yearly needed here will be made immediately, but in the meantime we have natural indigo coming in from China and the East. It is not as pure as that made artificially, but—these are war times. The whole list of dyes made from toluol, which are among the most valuable, must be practically omitted for the present. The toluol goes to war as T. N. T. [trinitrotoluol, the high explosive], and that is more important than dyestuffs.

PLENTY OF CRUDE MATERIALS

The great big thing about the industry is that there are now enough by-product coke ovens in the country to furnish all the crude materials needed—except toluol during the war. That means that we shall not have to go abroad for them any more. The next is that great American chemical manufacturers have taken up the production of intermediates and these are now made, some in abundance, some in small quantities,—but others not yet —right here in the United States. And the third is the splendid equipment of great American works owned, controlled, operated, and manned by our own citizens. They are still too much rushed by the problem of keeping the mills moving, and they are a little out of breath, but they are going strong.

Then what are we to expect after the war? Let us leave all discussion of the tariff out of consideration in this article. There is a duty on dyestuffs, there is a very able tariff commission in Washington, and since everybody knows how the industry may be killed by German dumping let us not consider it at this time. What the industry must have is the support of those who use dyes. An insistent demand for dyestuffs that were convenient for special purposes but which are not actually necessary will throw the business back into German hands again because it prevents American manufacturers from making the things most urgently needed. If the users of dyes will work together with American manufacturers with good will, the American makers will solve their problems for them, because they have at their command the best staff of textile chemists in the country. Despite the fact that vast fortunes have been put into plants for future work, the industry can endure only if users and makers of dyes work together until in time all the colors really needed will be available. I cannot emphasize too strongly that the present trouble is not in quality but in variety, and this will care for itself as time goes on and one after another of the missing dyes is brought out. In June last year there occurred the consolidation, to which we have referred, of several great American works into one corporation. The two largest dye-making concerns in the country which were parties to the combination were running at 100 per cent. capacity. To avoid duplication, production in one of the two was reduced to 40 per cent. capacity by transfer of some of its lines to the other, and enlarging the units of the latter. By November, the first had increased again to 100 per cent. capacity, having filled its works with the manufacture of dyes that had not been made here before but were urgently needed.

The manufacture of coal-tar dyestuffs is the last cry in chemical industry. It is the most complex, the most scientifically erudite and difficult of all of them. It has saved the textile situation. It has been built for the future. It is organized with a view to progress in America. America needs it for her scientific development and standing, for preparedness, and because it is nationally unwholesome to let any other people control us. It is altogether a good thing for us and it is well worth the keeping.

Dye Products and Chemical Co. Products

ACCORDING to information received from the Dye Products and Chemical Co., Inc., their plant at Newark, N. J., which was opened in 1915, began operations by the manufacture of Aniline Oil, which was commercially produced in that year.

During the year 1916 the following products, among others, were produced: Bismarck Brown R, Bismarck Brown Y, Chrysoidine R, Chrysoidine Y, Toluidine and Naphthol Green.

During the year 1917 the capacity of the plant was considerably increased and the following intermediates and colors were added to the products already being manufactured: Meta Toluylene Diamine, Meta Phenylene Diamine, Para Phenylene Diamine, Amino Azo Benzene, Alizarine Blue Black, Alizarine Yellow G, Ponceau Scarlet, Fast Acid Yellow, Chrome Red, and several other chrome colors.

Williamsburg Chemical Company Now Offers a New Color

The Williamsburg Chemical Company of Brooklyn, N. Y., has shown considerable progress in the manufacture of American colors.

The results they have obtained in the manufacture of some of the most difficult products means a step further toward establishing an American dye industry.

Their initial product was Sulphur Black. They lost little time in perfecting a good black, which they sold in large quantities for domestic and export. As a result they have obtained the significance of being one of the largest and most efficient manufacturers of that product.

They then ventured into the manufacture of Malachite Green, which instantly proved a great asset to the domestic and foreign markets. They are selling to-day more of this color than was imported into this country previous to the outbreak of the war.

It then occurred to them that the manufacture of Potassium Permanganate would be of great advantage to the country, and they put all their energy into producing this product. They now have an equipment which will supply a good-sized demand.

They have also taken up the manufacture of Auramine, Sulphur Brown, and Sulphur Khaki, which they are now supplying in quantities to our American users.

In order that they show something new for the forthcoming exhibition at the Grand Central Palace, they have hurried the completion of a Brilliant Green, W.

According to their advices, they are at present ready to fulfill orders on this product.

The company is preparing for the manufacture of a number of other very much wanted chemicals and dyestuffs, the production of which will help build up a strong National dyestuff industry, and, with the help of the public, this industry will survive and remain under the American Flag.

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MYRON DREW REESER, Managing Editor

THE AMERICAN DYESTUFF REPORTER extends a most hearty welcome to visitors at the Textile Exhibition. Naturally, we are more interested in the dyestuff industry than in other departments of textile manufacture. We believe that the exhibits shown at the Grand Central Palace by many of the leading manufacturers of dyestuffs will go far toward persuading those who are able to inspect them that the American dyestuff industry has come to stay and that the progress which has been made up to the present time is truly remarkable when all the tremendous difficulties in the way of the establishment of this industry in America are taken into consideration.

We hope that this issue of the REPORTER will, in some small measure, aid in spreading an honest interest in the American dyestuff industry among textile manufacturers. It has not been our aim to deal with technical subjects at this time. We have felt that a majority of the people who visit the Textile Exhibition will be not so much professional dyers as men interested in textiles from other standpoints. For their information we have endeavored to give, in a broad way, an account of what has been accomplished by American dyestuff manufacturers and of what may be expected of them in the future. Before the outbreak of the war there was less known about the dyestuff industry in America than about any other industry on which the manufacture of textiles is equally dependent. In order to have this great industry become truly American there must be spread broadcast throughout the nation a geat deal of general information with regard to the fundamental processes of dyestuff manufacture to the end that a broad spirit of co-operation and support may be propagated among all who are in any way connected with the consumption of dyestuffs—and this includes practically every citizen of these United States.

We will be glad to welcome any of our readers from out of town at our booth No. 374, on the fourth floor. Any courtesy which it is within our power to show will be extended with the greatest of pleasure. We sincerely trust that our visitors will be numerous and that we may be afforded an opportunity to co-operate with all who are seeking information of any sort in regard to dyestuffs and their uses.

Enclosed with this issue will be found a subscription blank. We trust that those of our friends who have found the REPORTER interesting and useful will avail themselves of this opportunity to assist the publishers in broadening and extending its sphere of usefulness. It must be remembered that only by the receipt of tangible evidence to that effect are we able to know that our efforts in behalf of the dyestuff consumers of the country are appreciated. Moreover, the publications devoted to our infant industry need support just as much as does the infant industry itself. If you believe in a protective tariff for American-made dyestuffs and the enactment of anti-dumping legislation—send in your three dollars for fifty-two issues of the REPORTER, and help the good work along.

In our issue of last week we asked consumers to advise us as to what particular colors they felt to be most needed at the present time. This information is desired by a large manufacturing firm which has ample facilities but wishes to direct its energies where they will do the greatest good. They have asked the REPORTER to help them determine the nature of the colors upon which they should concentrate and we in turn ask for your opinion. We thank those who replied to last week's query but would appreciate a more general expression of opinion. Won't you let us know what colors you feel are needed at the moment, and so possibly help us to see that the need is met?

DU PONT AMERICAN INDUSTRIES IN THE DYESTUFF FIELD

COMPANY WILL MAKE NO ANNOUNCEMENTS UNTIL COLORS ARE BEING PRODUCED COMMERCIALLY. WILL CONCENTRATE ON RARE COLORS. PERMANENT AMERICAN INDUSTRY ASSURED.

THE entrance of the Du Pont interests into the field of aniline dye making is unquestionably an event of highest importance to this industry. When history is written and the permanent establishment of an American Dyestuff Industry has become an accomplished fact, it is more than probable that the Du Pont Company will be found to have played a leading rôle in making possible this accomplishment.

Feeling the truth of this prediction and realizing the incompleteness of any history, however brief, of the dyestuff industry in America which included no account of the Du Pont activities in this line, the writer recently called on N. R. Poucher, director of the dyestuff sales department of E. I. Du Pont de Nemours & Company, at his office in Wilmington. It was the writer's hope that Mr. Poucher would authorize the publication in the REPORTER of a complete narrative reciting at some length the preparations of the Du Pont Company for active participation in the dyestuffs field, including a forecast as to what specific colors might be expected to issue from their plants, together with statistics showing the probable extent of their manufacturing facilities, etc.

Much speculation is heard in the trade as to the extent and nature of the Du Pont activities in the dyestuff field. While this article gives little definite information, it outlines the general direction which these activities will take.

In this hope the writer was disappointed. Mr. Poucher is the most conservative of men and, in this characteristic, reflects the attitude of the entire Du Pont organization. Briefly, this attitude may be summed up in the expression of the good old maxim, "deeds, not words."

According to Mr. Poucher, the one concern of his department for the present is the production of colors—not the manufacture on a tremendous scale of staple products, easily made, which are the articles of quantity consumption at the moment, but the development in perfected form of those rarer colors for whose production exhaustive research and painstaking experimentation, backed by ample capital and equipment, are necessary.

In the development of a program of this sort publicity is of no value either to manufacturer or consumer and may be distinctly embarrassing to both. If, for instance, it were announced that the Du Ponts were working on and expected shortly to produce in commercial quantities certain colors in great demand among cotton converters and now practically unobtainable in this country, no good would be accomplished and much harm might be done. Converters might be led, because of the confidence which the name Du Pont inspires, to base their plans upon the assumption that early supplies of these colors would be available; yet, such are the uncertainties of any development of this nature, some unforeseen difficulty might, at the last moment, prevent the production in commercial quantities of products which had been quite successfully turned out in the laboratory.

For this reason no announcement or intimation is to be expected from the Du Pont Company until a color is actually being manufactured and, hav-

ing met all final tests, is available for consumer use. Announcements will be made, however, as fast as colors are perfected and it is no breach of confidence to say that such announcements may be expected at more or less frequent intervals from now on.

At the present time the Du Pont Company is producing and shipping in quantity synthetic indigo, a product with which the leading German chemists wrestled from 1882 until 1897 and which, having produced, it took them until 1910 to introduce successfully into the American market. That this feat which took the Germans nearly thirty years has been accomplished by the Du Ponts in a few months speaks well for what may be expected in the future.

Speaking of the ability of the Du Pont interests to accomplish seemingly impossible tasks, it might be mentioned that at the outbreak of the war they found themselves suddenly called upon to increase tremendously their output of explosives and in the shortest possible space of time. Plans were approved for a plant at Hopewell, Va., the completed cost of which was in excess of $65,000,000.00. Competent engineers predicted that the erection of this plant would require more than two years, yet at the end of *seven months after breaking ground the entire plant was completed and in operation.*

An achievement of little less magnitude is in process of accomplishment in the dyestuffs plant at Wilmington. It is not permitted to give facts or figures but those who have watched the development of the works report that their vast extent, the care and foresight with which they are laid out and the rapidity with which they have been rushed to completion would be unbelievable were it not for the actual ocular demonstration. The writer was permitted to see panoramic photographs of the site occupied by the dyestuffs plant, taken at intervals of about thirty days from the beginning of construction down to the present time. We greatly wish we might reproduce them in the REPORTER as the series tells a story which it is quite beyond the writer's ability to narrate.

In regard to the permanency of the dyestuff industry in America, it is the conviction of the Du Pont interests that Germany will never be able to regain the trade of which war-time conditions have deprived her. In other words, Made-in-America Dyes have come to stay. The only thing which can defeat such a devoutly to be hoped for consummation, according to Mr. Poucher, is the failure of American manufacturers to produce the colors themselves. There is no basic material more readily accessible to Germany than to the United States; in fact, we are favored in all such respects. Neither is much stock to be taken in the so-called "secret formulas" of the Germans. The production in this country of any color which was formerly made in Europe is simply a matter of painstaking research and experimentation. There will no doubt be tariff protection, but an extreme tariff will not be essential so-long as Germany is prohibited from selling here more cheaply than she sells in other parts of the world. And it is probable that even if she felt inclined to sell at a loss in this country in order to stifle American competition she would be financially unable to do so. At the close of the war German industry is not going to be able to spend millions in an effort to regain lost foreign commerce—at least she will not be able to do so if America does her part in seeing that the war results in an Allied victory. More than this, it must be remembered that Germany will not again in the near future be able to manufacture so cheaply as before the war. Her man-power will be vastly diminished, labor will be at a premium and every cost of production will be tremendously higher than previously.

For these reasons and to the end that the dyestuff industry in this country may be firmly and permanently established, it is the patriotic duty of every American manufacturer of dyestuffs to devote his every resource and bend his every energy to the development of colors which have not, up to the present time, been successfully produced on this side of the Atlantic. If these colors are not produced, it is unreasonable to

expect that our consumers, however patriotically inclined, will refrain from filling their needs from any available source. If, however, the colors are produced here it will be not only possible but profitable as well to sell them to American consumers even after German competition is restored.

There is no doubt that the next two or three years will prove to be the most trying time which consumers of dyestuffs in America have been called upon to face since the outbreak of the European war. During the past three years the textile mills of the country have been exceedingly fortunate in being able to secure dyestuffs which were even approximately suited to their needs. That they have been so able to continue in operation has been, in considerable part, owing to the fact that there were on hand in this country and elsewhere throughout the world fairly large stocks of German colors. This fact made it possible for the various textile mills to continue operations, for, in addition to curtailing consumption, there were exchanges of dyestuffs—the selling of something that was not wanted and the buying of something that was—and there was also the purchase of colors from other consuming countries, such as China, etc.

All of this is now at an end—the world is as bare of coal-tar dyes as of fats and oils. Hence, until the manufacture of the rarer colors such as were previously produced only in Germany is accomplished by American firms, our dyestuff consumers must reconcile themselves to facing conditions which will be far from favorable. Everything which can be done to produce these much-needed colors is being undertaken. It is confidently believed that the entrance of the Du Pont Company into the dyestuff field is most opportune and that their efforts along these lines will go far toward remedying the present conditions. It is obvious, however, that not all of the wanted colors—or, for that matter, any considerable part of them—can be produced at a moment's notice. In the meantime, while American capital and ingenuity are busy with these problems, it behooves dyestuff consumers throughout the country to be patient and to rest secure in the certainty that within a period of two or three years American manufacturers will be able to supply all of the deficiencies that now exist.

The Production of Coal Tar Crudes in America

(*Continued from page* 5)

increase in the percentage of by-product coke ovens, previously mentioned.

Another product obtained in the process of running coke oven gases to pitch is anthracene oil which yields anthracene, which, in turn, after purification, becomes the source of alizarin—an important product necessary to the manufacture of the so-called "alizarin" colors.

It is safe to say that the by-product coke ovens now established in America are ample to care for all the demands for raw material — benzol, toluol and their homologues — which our munition makers and dyestuff manufacturers will require. After the war, when the manufacture of explosives is reduced to a normal amount, these products will be available as motor fuel and will very likely come into general use for this purpose. The ordinary gasolene motor can be easily adapted for the use of benzol as fuel by slight adjustments of the carburetor.

As stated at the beginning of this article, a majority of the by-product coke ovens of the country are owned by the producing iron companies but in most cases the by-products themselves, which are not essential to the iron industry, are sold under contract to agents who merchandise these products. Chief among such selling agencies is the Barrett Company, which handles a large percentage of the available national supply. We have it on the authority of an officer of this concern that their supply of crudes is greatly in excess of the amount necessary to fill the requirements of the dyestuff manufacturers with whom they are affiliated and that the excess is available on an equitable basis to other manufacturers of intermediates and dyestuffs.

DEVELOPMENT OF THE DYEWOOD INDUSTRY IN AMERICA

SINCE the outbreak of the war the greatest interest among consumers of dyestuffs throughout the country has naturally centered in the development of an American aniline dyestuff industry—this because of the complete cessation of importations from Germany which had been previously almost the sole source of supply. Great as our interest in the coal-tar dye industry may be, it must not be overlooked that natural dyestuffs — chiefly logwood products—have long been produced in this country and, in fact, that this particular branch of the dyestuff industry has long since reached a state of perfection in America not exceeded elsewhere in the world.

The manufacture of logwood extracts is an old-established American industry. In the midst of the interest aroused by the development of aniline-dye making in this country we are prone to overlook this important fact.

As a matter of fact, it is unquestionably due to the existence of this native American industry that a great many of our textile mills were able to continue in operation during the period following the outbreak of the war when stocks of German colors in this country had become practically exhausted and before the American manufacturers of aniline colors had been able to develop the necessary plants to supply consumer wants. For these reasons it has seemed to the editor of the REPORTER that a brief history of the development of the dyewood industry in this country ought to prove both interesting and instructive.

The American Dyewood Company is the largest and most important manufacturer of natural dyestuffs in America. The company was incorporated in 1904, combining, as its name would indicate, the more important of the earlier existing American concerns manufacturing dyewoods. The history of these earlier concerns goes back to Revolutionary days.

The manufacture of dyewoods in America may be said to have started in New York with the pioneer predecessor of the American Dyewood Company, William Partridge, an English dyer. He founded in 1798, at Greenwich Village, a suburb of New York, now about West 10th street, the first dyewood mill in America. The power was furnished by a horse walking around a capstan. This device operated a small cutter provided with sawtooth knives. The chips produced were treated to develop the coloring principle of the wood and the manufactured ware proved in every respect equal to the dyewoods then used in England.

The powerful cutting machines employed to-day at the Riverside Mills, Chester, Pa., of the American Dyewood Company, are capable of reducing a five-foot log into small chips in about seventeen seconds.

The Greenwich Village mill becoming inadequate to supply the demands for its product, Mr. Partridge removed his factory to Gravesend, back of Coney Island, where, by means of a wheel and with the utilization of the tide-water for power, larger works could be operated. In 1868 the rapidly increasing business necessitated better facilities, and the establishement was moved to Greenpoint, Brooklyn; and in 1872 the business was incorporated as the New York Dyewood Extract and Chemical Company.

During this development in and about New York, other dyewood mills were coming into being in America. In 1844

a dyewood mill was started at East Boston by William P. Porter; in 1869 it was consolidated with several other dyewood concerns dating from about the same period and incorporated as the Boston Dyewood and Chemical Company. In 1892 the Boston Dyewood and Chemical Company was consolidated with the New York Dyewood Extract and Chemical Company; in this consolidation was also included the Atlantic Dyewood Company, which had been organized some ten years previously. The name of the new corporation was the New York and Boston Dyewood Company, and its dyestuff business was consolidated with the Sharpless Dyewood Extract Company of Pennsylvania, in 1904, as the American Dyewood Company.

Of special interest as the direct predecessor of the present manufacturing plant of the American Dyewood Company are the dyewood mills that were operated in the vicinity of Philadelphia. In 1835 John M. Sharpless erected a mill for cutting dyewoods at Waterville, near Chester, Pa. The works, up to a comparatively late day, were operated by water-power only. The problem of conveying the wood from the wharf in Chester to Waterville was solved by building enormous wagons, with wide tires, drawn by tandem strings of six horses.

In 1895 the business was incorporated as the Sharpless Dyewood Extract Company. The growth and increase of the dyewood industry after 1850 and the necessity for quicker transportation facilities led John M. Sharpless & Co. to remove their works from Waterville and to purchase a tract of land at Chester, Pa., on the Delaware River, where they erected the considerable plant since known as Riverside Mills. The mills were fitted with the most advanced machinery, the installation being completed in 1879. Situated directly upon navigable waters, served by two or three lines of railroads, and possessing every facility for the landing of raw materials and the shipment of finished products, this company enjoyed increasing success for a quarter of a century.

In 1904 the dyestuff business of the Sharpless Dyewood Extract Company and that of the New York and Boston Dyewood Company were sold to the newly founded American Dyewood Company, a Pennsylvania corporation, capitalized at $2,144,000.00.

The combination of resources thus effected gave immediate impulse to the growth and progress of the dyewood industry. Within a year it became evident that the Riverside Mills offered better facilities for producing and distributing dyewoods than the other mills of the company and the manufacture of natural dyewood extracts and products was rapidly concentrated at Chester. This concentration involved a doubling of the capacity of the works to meet a corresponding increase in the company's business and further increases in capacity and output have since been made. The present capacity of the plant is the product of about 65,000 tons of dyewoods per annum.

The numerous symmetrical and substantial buildings of the Riverside Mills cover a large area of ground with a frontage of 690 feet on the Delaware River. The situation insures an abundant supply of pure water and all the advantages of a tide-water location and there are docking facilities to accommodate the largest vessels in the West Indian and Mexican trade. Most of the vessels docking at the company's piers come from the West Indies, particularly from Haiti and Jamaica; some are from Mexican or Central American ports; a few are coastwise vessels from New York and elsewhere.

The American Dyewood Company, through its subsidiary company, the Compagnie Haitienne, controls large tracts in Haiti, on which are virgin forests of logwood, and through this subsidiary it operates an overhead tramway from these forests to Port de Paix on the northern coast of Haiti for the transportation of logwood in the stick.

For dyewoods and their extracts the Riverside Mills of the American Dyewood Company are the great manufacturing center of America. For size of annual output they are not surpassed

by any similar factory in the world. In this, as in all other manufactures, great changes for the better have taken place in both methods and machinery, resulting in vastly improved products. In this march of progress the American Dyewood Company is ever in the van and the reliable quality of Riverside products has made them a standard among the consuming trade.

Dicks, David Company Exhibit

THE exhibit of the Dicks, David Company, Inc., at the Textile Exhibition, occupying booth No. 255 on the third floor, will include various kinds of fabrics dyed by American dyers using Dicks, David Company's products. Photographs of the Company's plants are also a feature of their exhibit. Those who will represent the Company at their booth are: Messrs. B. Franklin Lippold, Geo. C. Lommel, John Ward, Edw. Wheeler, Emil Coone, D. R. Harriman, Jr., and Irwin H. Crumley.

Among the products being manufactured by the Dicks, David Company are the following: Direct Colors, Direct Sky Blue, Direct Blue 2B, Direct Navy Blue B, Direct Fast Yellow R, Congo Rubine, Congo Red, Direct Fast Orange RR, Direct Pink, Direct Brown, Benzopurpurine. Sulphur Colors—Sulphur Khaki, Sulphur Brown, Sulphur Black. Acid Colors—Alkali Blue, Soluble Blue, Acid Black, Amaranth, Ponceau Scarlets, Acid Orange O, Bordeaux, Croceine Orange R, Acid Scarlet 3B, Acid Red A, Metanil Yellow. Basic Colors—Fuchsine Crystals, Fuchsine Powder, Methyl Violet, Methylene Blue, Safranine, Bismarck Brown, Chrysoidine. Alizarine Colors—Alizarine Yellow R, Alizarine Green B, Alizarine Blue Black, Alizarine Brown R. Oil Colors—Oil Black, Oil Yellow, Oil Orange, Oil Scarlet, Oil Red, Oil Brown, Nigrosines Water and Spirit Soluble.

Newport Chemical Works' Products

AMONG the large producers of intermediates and dyestuffs in this country is the Newport Chemical Works, Incorporated, whose plant is located at Carrollville, Wis. Up to the close of 1917 this plant was occupied almost entirely with the manufacture of intermediates alone, but since the first of the year they have been taking up the production of dyestuffs and we are informed are now producing, among others, the following colors: Newport Direct Blue 2B, Newport Direct Sky Blue, Newport Direct Blue 3B, Benzo Purpurine 4B, Benzo Purpurine 4B Conc., Benzo Purpurine 10B, Newport Acid Fuchsine, Newport Direct Orange R, Azo Eosine G, Newport Acid Black 4 AN, Newport Direct Green B, Newport Direct Steel-Blue G, Newport Sulphur Indone 2R, Sulphur Green G. New colors are being constantly added to the line.

The Heller & Merz Company, Hamburg Place, Newark, N. J., manufacturer of chemicals, etc., has had plans prepared for alterations and improvements in its plant.

WHAT AMERICAN DYESTUFF MANUFACTURERS HAVE ACCOMPLISHED

> This article was written for the Reporter by a chemist associated with one of the largest American manufacturers of dyestuffs who has personally assisted in the accomplishments of which he writes. It is particularly interesting because of the bright outlook which it paints for the future of the industry in the United States.

THE story of dyestuff manufacture in the United States dates from 1879 when the Schoellkopfs at Buffalo commenced to manufacture. This story has been told so many times during the past few years that it seems almost superfluous to repeat it again. However, there are undoubtedly many persons more or less directly associated with or dependent upon the dyestuff industry in this country who have never fully comprehended the extent of the problems with which American manufacturers have had to contend or the really noteworthy results which they have achieved. Hence, for the benefit of those who have followed developments in this field only in a casual way, it may not be amiss to rehearse briefly the obstacles which have been overcome and the results which have been accomplished.

In the early days of dyestuff manufacture in this country manufacturers were compelled to import, principally from Germany, the so-called intermediates, which, by processes well known to dye makers, were converted into the finished products.

The manufacture of intermediates is really the foundation of the dyestuff industry from the manufacturing standpoint. These intermediates in turn are made from the so-called "crudes," for example, benzol, toluol, xylol, phenol, naphthalene, anthracene and a few others of equal importance but which are obtained in relatively smaller quantities. The list of "crudes" enumerated above comprise: Those from which are obtained by far the largest number of so-called intermediates. For the conversion of these "crudes" into intermediates lengthy and often intentionally complicated processes must be used. Prior to the war these intermediates were obtained from abroad more easily and cheaply than they could have been produced in this country. The reason for this is evident. In England and in Europe generally the recovery and utilization of the "crudes" has long since been an established industry, while in this country the recovery of these "crudes" has been almost entirely neglected. An instance may be cited which will serve to show to what extremes industrial chemists were put at the outbreak of the war, *i. e.*, carbolic acid or phenol. This product was formerly imported in large quantities and to such an extent that all American demands were supplied. After hostilities broke out the exports from Europe of carbolic acid immediately ceased. On account of the demand for this product as the basic raw material for the manufacture of picric acid, an explosive, search was at once made for available sources of supply in this country, when it was found that the amount of carbolic acid normally obtained was relatively small. The constantly-increasing demand for it lead to its manufacture from benzol, and this sudden demand gave rise to the now important synthetic phenol processes that are carried out in various parts of the country.

The dyestuff manufacturer, on the other hand, was compelled to seek energetically a source of supply of the organic acids that play so important a part in his work. Aniline had been pro-

duced in this country in rather large quantities prior to the war; but, owing to competition from Germany, the output gradually decreased. After the outbreak of the war and when foreign supplies were cut off, constantly increasing quantities were manufactured at the plant of the Benzol Products Company. This plant has been considerably augmented in extent, so that it is now possibly the largest single aniline-producing plant in the world. From aniline the intermediate manufacturer produces a number of products that are important in dye manufacturing, among which may be enumerated nitro benzol, aniline hydrochloride, dinitro benzol, meta phenylendiamine, sulphanilic acid, amidoazobenzol, paraphenylendiamine, metanilic acid, nitro toluol, ortho nitro toluol, para nitro toluol, toluidines, ortho toluidine, para toluidine, para nitro ortho toluidine, toluylenediamine, nitro xylol and xylidines. This list shows in a comprehensive manner the difficulties that the industrial organic chemists encountered, but these difficulties have been gradually overcome so that at the present time additions are constantly being made to this list, with the result that a corresponding increase in the number of dyestuffs is likewise taking place.

The products above enumerated belong to what chemists term the Benzol series, of which there are several hundred which need not be listed here. These derivatives of Benzol are to be supplemented for the convenience of the dye maker with a long series of derivatives of Naphthaline, familiar to us all as Tar Camphor. From Naphthaline there are produced a number of very important Sulpho Acids which serve as the secondary intermediates for a very large number of commercially important dyestuffs. These Sulpho Acids fall into several important subdivisions; there are Mono Sulphonic Acids, Di Sulphonic Acids, Trio Sulphonic Acids, etc., together with substitute products in which the Amido group figures conspicuously. It is needless to enumerate these derivatives of Naphthaline. Suffice it to say that the American chemist has been called to the emergency and in attacking the problem of these complex and commercially important derivatives he has overcome difficulties during the last three years which, it is safe to say, have seldom been encountered by chemists in other branches of industry.

The chemical staff, in both the research and works departments of the National Aniline & Chemical Company, Inc., have applied themselves industriously and with success during the past few years to the production of some of these more important Sulpho Acids, with the result that the list of dyestuffs in which they play an important part has gradually been lengthened. None of these Sulpho Acids are easy to manufacture; they require extensive plant not only for their fabrication but also for their purification. It must be remembered that in the early days of the dyestuff industry in this country there were some points regarding the manufacture of these acids that were not thoroughly known, that while Sulpho Acid of a reasonably high de-

gree of purity was obtained, the fact remained that there were some impurities that were difficult of removal, and it was to the removal of these impurities that the energy of a score of chemists was applied.

In the early days of the extended dyestuff manufacture in this country, succeeding the outbreak of the war, some of the finished dyes did not measure up to the standards previously known, particularly as to shade. This shortcoming was due not to the fact that we did not know in this country how to manufacture the dyes, but that the refining processes as applied to the intermediates were still somewhat imperfect. These difficulties have been in many instances entirely overcome, and in others the evil of their presence is being gradually lessened. It is only a question of time when the regular output of American intermediates will be uniform and of high standard.

The ramifications of the dyestuff industry are so varied that it is difficult to present a comprehensive survey of it within the compass of an ordinary article. The history of dyestuff development in this country must be written by someone who will be able to view in retrospect the work that has been done during the past forty-four months —work that has been accomplished by men laboring at high pressure and top speed.

American Color Mfg. Co. Products

THE American Color Mfg. Co., of Passaic, N. J., began the production of oil soluble colors in November 1916. The manufacture of these colors is still continued but since that time the Company has also taken up the production in large quantities of direct oil, chrysophenine, fast silk grey, sulphur green, chrome black, and a few other colors in small quantities.

The Crescent Color Company, West Front Street, Plainfield, N. J., manufacturer of dyestuffs, etc., has commenced the construction of a new addition to its plant. The structure is estimated to cost $20,000.

Civilization Against Kultur

E. C. Klipstein, President of E. C. Klipstein & Sons and Treasurer of A. Klipstein & Company, is the author of a very interesting little booklet entitled "The Struggle of Civilization Against Kultur," with the sub-title, "Four Thousand Years of Conflict." In this booklet Mr. Klipstein demonstrates clearly that the present world conflict is the final culmination of an age-long struggle of the Teutonic branch of the Aryan race to establish itself on the sea. He shows how this race has repeatedly assailed maritime powers of all ages, from the time of the early Greeks down to the present, and how their efforts have, in every case, been frustrated. This aim of the modern German empire is testified to by the inscription placed in every German merchant vessel—"Unsere Zunkunft liegt auf dem Meer"—"Our future is on the sea."

Mr. Klipstein points out that the Teutonic races have always been excellent fighters on land, but that they have always failed in an effort to develop equal maritime strength. The present conflict, he shows clearly, was inspired by the belief of the Germans that having subjugated Central Europe they would then be in a position to destroy the supremacy of Great Britain on the sea.

Mr. Klipstein has printed and is distributing widely this brochure at his own expense—an extremely patriotic action. Those who are interested may obtain copies by addressing A. Klipstein & Co., at 644 Greenwich Street, New York City.

The plant of the Logwood Products Corps., located in Haiti, is producing liquid logwood extract of 51° twaddle, without oxidation, the capacity of the plant being in excess of 150,000 lbs. monthly: operations were begun in 1917.

THE RECENT CONSUMPTION OF DYESTUFFS IN THE UNITED STATES

EDITOR'S NOTE: *Certain figures quoted in this article are based upon the results of an investigation conducted by the United States Tariff Commission covering the year* 1916. *The report of this investigation—such is the slowness with which government machinery moves—was only recently published. It is probable that if figures were available for* 1917 *their comparison with those of* 1913 *would show considerable changes as against the comparison between those for* 1913 *and* 1916. *In a general way, however, the principal points illustrated by the commission's investigation apply to conditions to-day as well as they did to those existing in* 1916, *and the author of the present article has brought out many of those points in a most interesting manner.*

THERE has been a vast amount of speculation for a year past as to the actual ability of our national dyestuff industry to meet, under existing conditions, the current demands of the textile and allied manufacturing interests for coloring materials. It is known, of course, that a very large number of specific dyes are unobtainable. The fantastic figures at which they are quoted, show that there is no domestic production and little or no importation from Switzerland or elsewhere.

On the other hand the output of our textile works has notably increased, and there is evidently a great consumption of dyes, and no particular complaint as to a pronounced shortage. Apparently the *volume* of coloring material required by textile and similar industries can be secured, even if the *variety* of colors is circumscribed.

It seemed desirable to the Tariff Commission to gain an approximate idea of current conditions, and it accordingly made inquiries of 77 prominent companies engaged in the manufacture, dyeing and finishing of textile fabrics, requesting data on the consumption of dyestuffs in 1913 and in 1916. The summary of the information thus obtained is exceedingly interesting.

The group of 77 companies used in 1913 dyestuffs to the extent of 33,403,406 lbs., valued at $6,841,527. In 1916, the consumption increased to 44,757,097 lbs., valued at $26,513,842.

First of all, this shows an average increase in quantity of 34 per cent. It is possible, if not probable, that the increase in actual coloring matter is less, due to a greater use of dyes in the form of paste.

In the next place, the increase in average value is striking. In 1913, the consumers paid, on an average, 20.5 cents per lb. for his colors. In 1916, the average rate was 59.2 cents—almost treble!

INCREASED USE OF NATURAL COLORS

It is interesting to note the extent to which natural colors displaced artificial dyes in general usage. We have been content hitherto with the general statement that there has been a very large substitution. Much of the effort of tinctorial chemists during the past two years has been, in fact, devoted to this field of substitution, and logwood has played the leading rôle. The report shows that cotton mills used nearly four times as much logwood in 1916 as in 1913. For woolens and silks there was an increase of about 500 per cent. Fustic was also employed to a notable degree. For cottons the increase was 1,100 per cent., for woolens 2,000 per cent. There was an increase of 540 per cent. in the use of sumach for cot-

ton goods, and of about 150 per cent in the use of cutch for silks and cottons.

Otherwise there was little apparent expansion in the use of natural colors for domestic needs, although very large amounts were manufactured for shipment abroad. The quantities of gambier and of quercitron varied little from the figures for normal years.

In addition to the heavy demand on a few natural dyes, as outlined above, it has been necessary to choose artificial colors for use in place of the convenient, fast vat dyes, of indigo to a considerable extent, and various indigoids, of numerous direct azo colors, of such dyes as primuline, rhodamine, benzopurpurine, etc.

The production of p-nitraniline and b-naphthol has assumed large proportions and the para-red is now doing duty for a variety of red tints. Much the same may be said of sulphur black and sulphur brown, now made on a large scale, and replacing, for the time being, a number of azo colors.

Some day a complete portrayal of the multitude of substitutions, now in current use in our country, will furnish entertaining reading.

At present we are interested in the verdict passed by these representative consumers of colors on the actual progress made by the new American industry.

There seems to be a general consensus of opinion that the industry has accomplished all and more than could be expected in the brief period of its growth. Here and there attention is called to minor failures, especially in connection with dyes for cotton, to meet the full standards of uniformity of tint and fastness to which the users of foreign colors have been accustomed in the past. It is, however, frankly recognized that occasional failures are inevitable when making a bold effort to accomplish much in a very brief time. Numerous colors are perfectly satisfactory. Where defects in others have been found, the quality is being steadily improved. The dyes designed more specifically for use on woolen goods are pronounced fully equal in fastness, quality and uniformity to the corresponding colors made abroad.

Industry on Permanent Basis

In general, consumers of dyestuffs feel convinced that the industry is established in the country upon a permanent basis, and that it is in the hands of men who are determined to make it respond completely to the needs and wishes of the vast multitude of those dependent upon the factor of color. Expression is also given to the conviction that legislation must adequately protect the young industry. If this is the case, it is felt that the competitive struggle for excellence between the American manufacturers will shortly assume the regular production of the very highest grades of colors in ample quantity to meet the needs of the entire American market. It will necessarily involve a very careful and comprehensive study of a multitude of varying factors to determine just what degree of protection is required by the different categories of high-grade colors in order to effectively preserve the American market during the initial years of experiment and adjustment. There should be, however, little question as to the readiness of political parties to grant the requisite measure of protection, when both producers and consumers demand it and when determined effort is made to establish it upon an equitable and scientific basis.

Furthermore, it is necessary that the entire industry, from crudes to finished products, as well as the collateral classes of coal-tar products used in medicine and the arts, should be exhaustively studied, and that proper provision should be made to insure the protection of *all* these compounds from American coal-tar.

Notice to Subscribers

Owing to the disturbance caused by war conditions in the postal service, we cannot guarantee prompt delivery of this journal through the mails. For delays in such delivery, while they should be reported at once to this office, we cannot accept blame.

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

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American Dyestuff Manufacturers Have Extensive Exhibits at Textile Show

THE Sixth National Textile Exposition which was opened to the public on Monday, April 29th, is proving all that its creators hoped it would. We have been told over and over again that the American manufacturers of dyestuffs would prove that their colors were equal to, or better than, pre-war types, and if one is to judge from the character of their exhibits, they have certainly made good.

American dyestuff manufacturers during the last two years have been seriously handicapped by the strongest kind of prejudice in favor of the German products. They have realized for some time that the industry would never be established upon a firm foundation until the women of America were educated to the point of believing that American-made dyestuffs are, type for type, equal to any German dye ever placed upon the market.

Judging from the interest displayed by women toward the practical exhibit of the various dyestuff manufacturers having space in the Show, it would seem that this demonstration, at this particular time, has done more toward combating German propaganda than has anything else which has been previously attempted.

At the various Chemical Expositions which have been held in the past, a demonstration of the practical application of dyestuffs was somewhat neglected. There is no real manufacturer of dyestuffs who will claim that the complete range of colors available before the war is now being produced in America. It is not this point that troubles the manufacturers as much as the persistent statement that American-made dyestuffs are not as fast to light and washing or generally of as high a character as the German.

In conversation with a representative of one of the largest manufacturing plants, we were assured that American manufacturers are now "delivering the goods." This gentleman goes on to say: "Color for color, the American dyes are a match for the German product every time. This is not a statement that may be questioned, as it is proven by every laboratory test. It is a mistaken idea that the Germans, in spite of intensive advertising, ever claimed absolute fastness for their products. Yet, in spite of this, many consumers of American-made colors claim that three colors are not fast.

"So far as the range of colors is concerned, we are now turning out most of the principal dyes in ample quantities for domestic consumption. Certain dyes we cannot make because the raw materials are not obtainable at the present time. The dyes which depend on Toluol, for example, cannot be made at this time because this particular product is needed for Government use.

"Every woman in America who buys fabrics that are dyed with American

dyes, should realize that they are as fast in every respect as any fabric dyed with imported dyes.

The interest displayed by women at the exhibit of the National Aniline and Chemical Company leads one to hope that they are sufficiently interested in the development of this industry to warrant their discouraging, in the future, the practice of many storekeepers who assure them that American dyes are not equal to the German. This exhibit of the National Company aroused particular interest because of its direct comparison of German and American colors. Samples of wool, cotton and silk cloths and yarns are displayed—one sample being dyed with a German product and the other with the American product which was made with American intermediates and developed in an American plant.

Approximately fifty colors are subjected to this comparison—including blues, reds, browns, yellows, purples, etc. The company has arranged a small laboratory in which dyeings are made at the request of those interested in any particular color. Much interest was manifested at this company's exhibit of Synthetic Indigo which is now being developed at the Brooklyn works of the company.

We are reproducing herewith a list of the products exhibited at the show by this company:

Acid Colors—Azo Rubine Extra, Azo Bordeaux, Brilliant Scarlet 3 R, Buffalo Fast Crimson R, Buffalo Fast Fuchsine 6 B, Buffalo Fast Fuchsine D, Buffalo Fast Fuchsine G, Buffalo Fast Fuchsine R, Cloth Red G, Cloth Red R, Croceine Scarlet MOO, Fast Red S Conc, Lake Scarlet G, National Scarlet BR, Wool Red 40 F, Wool Red 41 F, Xylidine Scarlet, Croceine Orange Y Conc, Crystal Orange 2 G, Orange A Conc, Orange S Conc, Azo Yellow A 5 W, Metanil Yellow 1955, Wool Yellow G, Wool Yellow Extra Conc, Resorcine Yellow, Buffalo Cyanone 3 R, Buffalo Fast Blue R, Induline NT, Ammaco Acid Green L, Ammaco Acid Green L Extra, Resorcine Brown 485, Resorcine Brown N, Buffalo Violet 4 B, Buffalo Fast Violet B, Buffalo Black 4 AB, Buffalo Black AR, Buffalo Black NBR, Buffalo Black RB, Buffalo Black 3 G, Buffalo Black 8 B, Buffalo Black 10 B, Duroi Black B.

Direct Colors—Erie Congo 4 B, Erie Delta Red 2 B, Erie Garnet B, Erie Garnet R, Erie Red 4 B Conc, Erie Orange 2 R, Niagara Orange Y, Ammaco Chloramine Yellow WB, Niagara Fast Yellow F, Niagara Yellow KM, Direct Yellow CG Extra, Erie Green MT, Erie Green WT, Erie Green WB, Niagara Blue 2 B, Niagar Blue 3 B, Niagara Blue D B, Niagara Dark Blue 3 R, Niagara Violet BW, Erie Brown C, Erie Brown GR, Erie Brown T, Erie Black GXOO.

Developed Colors—Diazine Black H Extra, Ammaco Primuline WB, Paranitraniline Red.

Sulphur Colors—National Sulphur Yellow B, National Sulphur Yellow BW, National Sulphur Yellow MT, National Sulphur Green SAP, National Sulphur Blue BD, National Sulphur Blue SAP, National Sulphur Sky Blue, National Sulphur Brown CG, National Sulphur Brown 2 G, National Sul-

phur Brown 4 G, National Sulphur Brown GW, National Sulphur Brown NN Conc, National Sulphur Brown TD, National Sulphur Khaki AA, National Sulphur Khaki AB, National Sulphur Khaki BK, National Sulphur Khaki BM, National Sulphur Khaki CC, National Sulphur Black F Paste, National Sulphur Black Superior, National Sulphur Black W B Powder.

Chrome Colors—National Alizarine Red BW 20 per cent Paste, National Alizarine Red BW Powder, Ammaco Chrome Orange R, Ammaco Chrome Yellow G, Ammaco Chrome Yellow GW, Alizarol Yellow 3 G, Buffalo Chrome Green CB, Serichrome Green B, Ammaco Chrome Blue B Double, Ammaco Chrome Blue 3 RYN 800 per Conc, Ammaco Chrome Blue GN Conc, Ammaco Chrome Blue RBN Conc, Chrome Navy Blue D Extra, Neutral Blue G, Serichrome Blue R, Alizarol Brown B, Alizarol Brown R B, Alizoral Black 3 G, Ammaco Chrome Black BN Conc, Buffalo Black 2 BN, Superchrome Black 6 BP.

Basic Colors — Ammaco Safranine BL, Safranine A, Chrysoidine 3 R, Chrysoidine Y Extra, Victoria Green WB Powder, Victoria Green Base, Basic Navy Blue DA Conc, Indoine Blue WB, Methylene Blue BB, Methylene Blue SP, Bismarck Brown 53 Conc, Bismarck Brown Y Extra, Methyl Violet 2 B, Methyl Violet 80-100, Basic Black BG, Basic Black BT, Brush Black.

Marden, Orth & Hastings Co.

An exhibit which is attracting much commendation is that of the Marden, Orth & Hastings Company. This exhibit occupies a large booth, the feature of which is a constantly changing rainbow effect produced by colored screens behind glass over which water is filtering. In our estimation, this is one of the most beautiful effects produced at the Show. Wool and cotton cloths are arranged attractively to demonstrate the application of the dyes produced by this company and its newly acquired subsidiary, the Calco Chemical Co. This company, too, is producing a large range of colors such as:

Acid Colors — Azidol Scarlet 2G, Azidol Red A, Azidol Red E, Azidol Red B, Azidol Red 2B, Azidol Red 4B, Azidol Orange Y, Azidol Orange O, Azidol Yellow R, Azidol Fast Yellow T, Azidol Yellow S (Soap), Azidol Green B 3343, Azidol Green G 3344, Azidol Green 2G 3345, Azidol Green B (Soap), Azidol Fast Green GG, Azidol Brilliant Blue G, Azidol Brown R 3375, Azidol Brown Y 3375, Azidol Khaki 3384, Azidol Khaki 3385, Azidol Violet R, Azidol Black 4B.

Chrome Colors on Wool—Chrome Khaki J 3341 (Paste), Chrome Brown Y, Chrome Brown RY, Chrome Yellow G, Chrome Yellow 2G (Paste), Chrome Blue R, Chrome Blue Black 1346.

Basic Colors—Safranine Y, Fuchsine R, Chrysoidine Y, Auramine O, Malachite Green, Methylene Blue, Victoria Blue SM, Voctoria Blue B, Methyl Violet (Powder), Bismarck Brown Y, Bismarck Brown R, Bismarck Brown 2R.

Direct Colors—Orthamine Red B,

Orthamine Red 6B, Orthamine Red Y, Orthamine Red BY, Orthamine Bordeaux, Orthamine Rubine, Orthamine Pink Y 3139, Orthamine Pink B 3173, Orthamine Claret, Orthamine Orange R, Orthamine Orange RR, Orthamine Yellow G, Orthamine Yellow R, Orthamine Maroon B 3417, Orthamine Maroon R 3418, Orthamine Blue 2B, Orthamine Blue 2BL, Orthamine Blue 2B Conc, Orthamine Heliotrope 3365, Orthamine Violet B 3366, Orthamine Violet R 3367, Orthamine Brown G, Orthamine Brown 3G, Orthamine Dark Brown 3380.

Dicks-David Co., Inc.

It is interesting to note the rapid advance of some of the smaller companies in the manufacture of dyestuffs. An example of this growth is seen in the exhibit of the products of the Dicks-David Co., Incorporated. This company was formed in 1916 by R. P. Dicks, who is the commercial head of the organization, and A. David, who added the scientific element so necessary in any technical organization.

The firm has strengthened its organization by the recent entrance of A. G. Bruinier as Vive-President. Mr. Bruinier has been connected with the Aniline Color industry for a great many years, both in this country and abroad, and his advent into the firm strengthens their position materially.

This firm began, with small capital, a small plant and produced one product. This color was Methyl Violet, and it immediately met with approval. Encouraged by this success, other colors were added, and to-day, after less than two years, they have two plants in operation.

The following statement, indicative of the policy of the company, was given the REPORTER: "The foundation thus laid is creating part of the American Dyestuff Industry which is bound to be permanent and which some day will supply the American users of colors all their requirements. What Germany could do, America certainly can do, and we know that the firm of Dicks-David Co. will do its part to accomplish this end."

The colors that this company have on display and are making practical dyeings of, are:

Direct Colors—Direct Sky Blue, Direct Blue 2B, Direct Navy Blue B, Direct Fast Yellow R (leaves silk white), Congo Rubine, Congo Red, Direct Fast Orange RR, Direct Pink, Direct Brown, Benzopurpurine.

Basic Colors—Fuchsine Powder, Methyl Violet, Methylene Blue, Safranine, Bis. Brown, Chrysoidine.

Sulphur Colors—Sulphur Khaki, Sulphur Brown, Sulphur Green, Sulphur Black.

Acid Colors—Alkali Blue, Soluble Blue, Ponceau Scarlets, Acid Orange O, Bordeaux, Croceine Orange R, Amaranth, Acid Scarlet 3B, Acid Red A, Metanil Yellow, Acid Black.

Alizarine Colors—Alizarine Yellow R, Alizarine Green B, Alizarine Brown R, Alizarine Blue Black, Nigrosines Water and Spirit Soluble, Oil Colors.

John Campbell Co.

The booth of John Campbell Co. was particularly attractive and indicated in every respect the conservative policy of the company. They are distributing a booklet containing a statement which should interest all those in the textile field. A member of the organization visited the REPORTER booth and assured us that any statement issued by his company would be met to the letter. The statement is headed, "Important Notice," and reads as follows:

"Colors of our manufacture bearing our trade names are in all cases equal to or better than the pre-war imported standards."

No practical demonstration of their products is being shown, but the decorations consist of materials dyed with their colors.

Samples of the following dyestuffs are displayed:

"Amidine"—Foremost series of Direct Cotton Colors.

"Kromeko"—Quality series of Fast Chrome Colors.

"Aceko"—Dependable series of Acid Colors.

"Amalthion"—Reliable series of Sulphur Colors.

Basic Colors, Khaki Colors, Dyewood Extracts.

Sterling Color Co.

The Sterling Color Company, Inc., has on exhibition a line of colors produced by their principals, the Peerless Color Company, Inc., Bound Brook, N. J., consisting of Direct Fast Cotton colors brought out to meet the demand of the trade for cotton colors fast to acid and other agents.

They are Toluol products and are equal in all respects to the German standard against which they are made. They consist of Direct Fast Roses similar to Diamine Rose of Cassella; Primuline SF equal to the best German type; Direct Fast Yellows similar to the Diamine Fast Yellows of Cassella; Direct Fast Oranges; Direct Navy Blue, and others.

All of these colors are giving excellent satisfaction to the Mills, and the deliveries are made regularly and uniformly.

There are a number of allied products in process which will be offered to the trade as soon as they are ready.

They are also offering Anhydrous Sulphurous Acid made by the King Chemical Co., Bound Brook, N. J., with whom they are associated. This product is recommended as an excellent anti-color having, on account of its compact form (compressed gas), many advantages over Bisulphite of Soda and other forms of Sulphurous Acid.

American Dyewood Company

The exhibit of the American Dyewood Company in Booth No. 275 on the third floor is unique in the extreme. The railing about the booth is formed by posts of the various dyewoods—logwood, fustic, hypernic, etc.—in their native state. There is also a large case showing these woods both chipped and powdered, and glass jars containing the crystals, pastes and extracts derived therefrom. There is also an extensive exhibit of samples of cloth and skein dyes with the natural colors manufactured by this firm.

The Dyewood Company has—in addition to its manufacture of natural dyestuffs—for many years acted as selling agents for a line of aniline colors, samples of which are exhibited in a separate case.

The products which this company is prepared to supply to the trade, according to their published list, are as follows:

Dyewood Extracts—Campeachy Logwood chipped and ground, Laguna Logwood chipped, Extract Logwood No. 1 for wool, Extract Lokwood No. 4 for silk, Extract Logwood N. for cotton, Extract Logwood Clarified, Extract Logwood Solid, Hematine Paste 228, Red Paste Logwood, Hematine Crystals 605 for wool, Logwood Crystals S W for weighting silk, Fustic chipped and ground, Extract Fustic for wool, Extract Fustic for cotton, Extract Fustic Cleared, Extract Fustic Solid, Fustic Crystals, Young Fustic Crystals, Quercitron Bark Extract Solid, Quercitron Bark Extract W U, Osage Orange Extract, Powdered Turmeric, Brazilwood chipped and ground, Limawood chipped, Camwood ground, Red Saunders ground, Barwood ground, Hypernic Extract R, Hypernic Extract Solid, Hypernic Crystals, Extract Cutch Y, Extract Cutch A Y, Extract Gambier, Extract Sumac, Extract Sumac Stainless, Extract Sumac C P, Sumac Crystals, Persian Berry Crystals, Indigo (Kurpah — Bengal — Guatemala—San Salvador, etc.), Dutch Madder, Hemlock Extract, Ground Half refined Tartar, Extract of Archil, Extract of Indigo.

Aniline Colors—Patent Blue, Wool Green S, Auramine, Fast Light Yellow, Chrome or Alizarine Yellow, Chrome or Alizarine Brown, Chrome or Alizarine Orange, Chrome or Alizarine Black, Chrome or Alizarine Red, Chrysophenine, Diazo Black BH, Delphine Blue, Prune Pure, Alizarine Blue OCR, Gallocyanine Powder, Fast Cotton Red, Sulphur Black, Sulphur Blue, etc.

All available Direct Colors, Acid Colors, Basic Colors, Sulphur Colors.

Williamsburg Chemical Company

The Williamsburg Chemical Co. exhibit is in charge of the sales manager Chas. L. Hirsch, and shows plainly that the development of good colors is considered essential by this firm, even though by insisting upon quality they must necessarily curtail output.

This exhibit is unpretentious. Large dyed skeins are shown, the dyes used being Malachite Green, Brilliant Green, Auramine, and Sulphur Black. The company is also manufacturing Permanganate of Potash.

It is so much better to exhibit even three colors, if those colors are good, than to offer a hit-or-miss lot of occasionally satisfactory colors. Much credit should be given to the smaller companies who are really producing creditable products, for they are doing their share toward the establishment of the industry.

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MYRON DREW REESER, Managing Editor

Du Pont Company to Play Big Role in Dyestuff Industry

Production of Synthetic Indigo in Large Quantities to be Followed by Other Rare Colors.

DR. CHARLES L. REESE, chemical director of E. I. Du Pont de Nemours & Co., brought to the convention of the National Association of Cotton Manufacturers and the American Cotton Manufacturers' Association in session at the Biltmore Hotel on May 2nd a message which declares America's absolute independence of the world in the dyestuff industry.

Nearly all dye problems have been solved, he said, and the Du Ponts are at this moment turning out synthetic indigo of the best quality on such a large scale that the commercial success of the undertaking is assured.

Not only is indigo being made in quantity, Dr. Reese said, but the plant is turning out all of the necessary intermediates for its production.

Dr. Reese made to the assembled textile manufacturers the definite promise that in a very short time the indigo plant will be brought to its full capacity, which it has been figured out will supply all of the needs of the United States and Canada.

In addition to the production of this most important member of the dye group, Dr. Reese announced that his company soon will be manufacturing types of the finest basic, acid and direct colors, and a little later will put on the market the alizarine colors with their most needed derivatives, namely, the vat colors. Sulphur colors and chrome colors will be put on the market in a comparatively short time. He said that while it is not possible at present to give definite dates, the plants are progressing very rapidly, when considering the difficulties of securing machinery and raw materials, and he added "we feel certain that we will make good our promise to become a large factor in making this country independent in the dyestuff industry."

In leading up to these important announcements, Dr. Reese went into a history of the development of commercial chemistry and pointed out the important part which the Du Pont Company has played in this field. He said that his company's success in solving the chemical problems presented by the sudden great demand for explosives, following the opening of the European war, gave him and his associates confidence that the world-wide dye problem could also be solved.

"It would have been an easy task," he said, "to manufacture a line of colors, if advantage had been taken of the intermediates which could have been purchased on the market, and considerable profits could have been secured by the manufacture of a cheap line of goods, which have found and still find ready sale on the market to-day. This policy, however, was not followed by us, because we believe that the only safe foundation for the color industry is in the manufacture of a comprehensive line of intermediates, starting at the bottom from the crudes, and on such a large scale as to make it economically sound."

"The step from explosives to dyes is logical from a business as well as from a chemical standpoint. It is only a matter of evolution. The explosive manufacturer starts first with all of the necessary raw materials which are products of this country; he is not dependent on Europe."

In the case of the Du Pont Company a very large and carefully selected chemical and engineering organization has been devoting its energies to the dyestuff situation. Unequaled plant and laboratory facilities were already in existence before the outbreak of the war and there had been established an adequate commercial organization. With these physical requirements already met little remained to be done.

Frank Hemingway, Inc.

The exhibit of Frank Hemingway, Inc., is rather unusual, as they show a complete laboratory, not for demonstrating the use of their dyes, but for the testing of the product before it leaves the plant. This should mean much to the trade, for the testing of each batch of dyes is something that we sometimes hear of as being done, but seldom see.

The booth is very attractively decorated and if one is to judge by the number of telephone calls that they are receiving, some business at least has developed from their demonstration of the actual test of each pound of dyestuff that leaves their plant.

Those in charge are Edw. A: MacKinnon, chemist in charge of laboratory, T. F. O'Keefe, sales manager, and H. H. Foster, manager of Intermediate sales department.

They are offering the following colors: Victoria Blue B, Victoria Blue Base, Crystal Violet 6B, and Formyl Violet.

Within the month this company expects to place upon the market Wool Green S.

Chas. S. Tanner Company

The Chas. S. Tanner Co. has an interesting exhibit of "Polyzime," a product manufactured by the Takamine Laboratories, for which they are sole selling agents. "Polyzime" is a new and powerful enzymic product of Japanese origin and of a purely vegetable nature. Its enzymic action applies equally to vegetable and animal compounds, hence it is peculiarly available for de-gumming and de-sizing all textile fibres.

Some of the advantages claimed for "Polyzime" are that it has remarkable powers for solubilizing starch, that it cleans goods not only of starch but of protein gums as well, that it dissolves readily in an ordinary bath, that it does not affect colors and produces a softer finish.

"Polyzime" is a thin liquid and for this reason is very easily handled. Its action is, however, very powerful. In proof of this, a test which is performed in the booth is to drop a few drops of "Polyzime" into a test tube half full of coagulated starch. Upon this application of a little heat the starch becomes completely dissolved into a colorless liquid.

Southern Dyestuff and Chemical Co.

The booth of the Southern Dyestuff and Chemical Co. consists of an attractive rest-room, no display being attempted, as the company is only introducing Obex Logwood, a product of the National Gum and Mica Co.

The booth is in charge of J. H. Gledhill, New York representative. S. W. Buck and W. M. Tailor of Charlotte, N. C., are also in attendance.

It is reported that the Federal Trade Commission has issued a complaint against F. E. Atteaux & Co., importers and manufacturers of dyestuffs and chemicals, Boston, alleging that it has used unfair competitive methods in its business. Hearings before the commission on the complaint have been set for June 3.

Partial List of Exhibitors at the Textile Show

AN idea of the scope and size of the Sixth Annual Textile Exhibition at the Grand Central Palace may be gained from a perusal of the following list of firms which held exhibits thereat:

A

Abell-Howe Co., Chicago; Adirondack Woolen Co., Little Falls, N. Y.; American Crayon Co., Waltham, Mass.; American Dyewood Co, New York; American Kron Scale Co., New York; American Moistening Co., Boston; American Pulley Co., Philadelphia; American Steam Gage & Valve Mfg. Co., Boston; American Tool & Machine Co., Boston; American Warp Drawing Machine Co., Dorchester, Mass.; American Wool & Cotton Reporter, Boston; American Wringer Co., Woonsocket, R. I.; Anglo-American Textile Machinery Co., Abbington, Mass.; Arco Co., Cleveland, O.; Ashworth Bros., Inc., Fall River, Mass.; American Alkali & Acid Co., Bradford, Pa.; American Silk Journal, New York; American Wool Co., Boston; Adjustable Guide Mfg. Co., Inc., New Britain, Conn.; Allen Mfg. Co., Hartford, Conn.; Alexander Bros., Philadelphia; American Bead Co., New York; AMERICAN DYESTUFF REPORTER.

B

Barber-Colman Co., Rockford, Ill.; William Barnet & Son, Albany, N. Y.; Bach & Greenfield Co., Newark, N. J.; Borne, Scrymser Co., New York; Bragdon, Lord & Nagle Co., New York; H. W. Butterworth & Sons Co., Philadelphia; Judson Butterworth Corp., New York; B. F. Bailey & Co., New York; W. H. Brown Son Co., New York.

C

William Carter Co., Boston, Mass.; Carrier Engineering Corp., New York; Chapman Mfg. Co., Winchester, Mass.; Chelsea Fibre Mills, Brooklyn; Clark Publishing Co., Charlotte, N. C.; Clifford & Lawton, New York; Cling-Surface Co., Buffalo, N. Y.; Collings Tay-

lor Co., Cleveland, O.; Coppus Engineering & Equipment Co., Worcester, Mass.; W. S. Cordingly & Sons, Boston; Cotton, Atlanta, Ga.; Stuart W. Cramer, Charlotte, N. C.; Crew-Levick Co., Philadelphia; Crompton & Knowles Loom Works, Worcester, Mass.; John Campbell & Co., New York; Chevrolet Motor Co., New York; Carlyle-Johnson Machine Co., Manchester, Conn.; Central Textiles Co., New York; David Cohen Sales Corp., New York; Clenzall Machines Co. of America, St. Louis, Mo.; A. D. Clark & Co., New York.

D

Davis & Furber Machine Co., North Andover, Mass.; Delahunty Dyeing Machine Co., Pittston, Pa.; Diamond State Fibre Co., Bridgeport, Pa.; R. & J. Dick, Ltd., New York; Dicks, David Co., Inc., New York; Dicks, Slosson Co., New York; C. S. Dodge, Lowell, Mass.; Dodge Sales & Engineering Co., Mishawaka, Ind.; Draper Corp., Hopedale, Mass.; Delcamo Machine Co., Inc., New York; Frank Davis, Pawtucket, R. I.; Duplan Silk Corporation, New York; Dry Goods Publishing Co., New York; E. I. du Pont de Nemours Co., Wilmington, Del.

E

Electro Bleaching Gas Co., New York; Easton & Burnham Machine Co., Pawtucket, R. I.; T. C. Entwistle Co., Lowell, Mass.; Eustic, Pennock & Co., Boston; Economy Baler Co., New York.

F

Fairchild Advertising, Inc., New York; Fairbanks Co., New York; Fales & Jenks Machine Co., Pawtucket, R. I.; Fibre & Fabric, Boston; Fibre Special Manufacturing Co., Philadelphia; William Firth, Boston; J. B. Ford Co., Wyandotte, Mich.; Foster Machine Co., Westfield, Mass.; Franklin Process Co., Providence, R. I.; Giles Engineer Co., Inc., New York.

G

General Electric Co., Schenectady, N. Y.; General Fire Extinguisher Co., Providence, R. I.; Grand Rapids Textile Machinery Co., Grand Rapids, Mich.; Graton & Knight Manufacturing Co., Worcester, Mass.; Grosser Knitting Machine Co., New York; T. H. Gray & Co., Boston; Goetz Silk Co., New York; Goodall Worsted Co., New York; Gordon Hay Co., Utica, N. Y.

H

John Hetherington & Sons, Ltd., Boston; Benj. Hey & Co., Cincinnati, O.; Howard Bros. Manufacturing Co., Worcester, Mass.; Hungerford & Terry, Inc., Philadelphia; Hussong Dyeing Machine Co., Groveville, N. J.; Hopedale Manufacturing Co., Hopedale, Mass.; Frank Hemingway, Inc., New York; Hewitt Publishing Co., New York; Hermas Machine Co., Paterson, N. J.

J

Jefferson Union Co., Lexington, Mass.; Johnson & Bassett, Worcester, Mass.; C. Walker Jones, Inc., Philadelphia, Pa.; John Jones & Hardy, Inc., Hudson, N. Y.; Cyril Johnson Woolen Co., Stafford Springs, Conn.

K

Knit Goods Publishing Corporation, New York; Kaumagraph Co., New

York; Keystone Fibre Co., Yorklyn, Del.; Keystone Lubricating Co., Philadelphia; Klauder-Weldon Machine Co., Yardley, Pa.; Kaltenbach & Stephens, New York.

L

Lambeth Rope Corporation, New Bedford, Mass.; Lead Lined Iron Pipe Co., Wakefield, Mass.; Leighton Machine Co., Manchester, N. H.; Thomas Leyland & Co., Readville, Mass.; Link Belt Co., Nicetown, Pa.; Lyon Manufacturing Co., Fitchburg, Mass.; Liberty Mutual Insurance Co., Boston; W. T. Lane & Bro., Poughkeepsie, N. Y.

M

Macrodie Fibre Co., Woonsocket, R. I.; Marden Orth & Hastings Corp., New York; Mason Machine Works, Taunton, Mass.; H. B. McCollum, Philadelphia; John H. Meyer & Co., Inc., New York; Mercury Manufacturing Co., New York; Merrow Machine Co., Hartford, Conn.; Monroe Calculating Machine Co., New York; Morse Chain Co., Ithaca, N. Y.; Frank Mossberg Co., Attleboro, Mass.; Mengart Knitting Co., Brooklyn; J. A. Migel, New York; McLane Silk Co., New York.

N

National Aniline & Chemical Co., New York; National Association of Wool Fibre Manufacturers, Boston; National Flue Cleaner Co., Inc., Trenton, N. J.; National Woolen Co., Cleveland, O.; Newbert Color Co., Boston; New York & New Jersey Lubricant Co., New York; N. Y. Revolving Portable Elevator Co., Jersey City, N. J.; Norfolk Woolen Co., Franklin, Mass.; Norma Co., of America, New York; New York Commercial, New York; Max Nydegger, New York; Naday & Fleischer, New York; National Marking Machine Co., Cincinnati, O.

O

Oakley Chemical Co., New York; Onondaga Trading Co., New York.

P

C. M. Plowman & Co., Philadelphia; G. M. Parks Co., Fitchburg, Mass.; Permuit Co., New York; Philadelphia Drying Machinery Co., Philadelphia; Philadelphia Textile Machinery Co., Philadelphia; Pratt & Cady Co., Hartford, Conn.; Parks & Woolson Machine Co., Springfield, Vt.; Parker Fisher Sales Co., Pittsburgh, Pa.; Patterson-Gottfried & Hunter, New York; Patterson-Sargent Co., New York; Henry F. Perkins, Andover, Mass.; Consulate General of Portugal, New York.

(*Continued in next issue*)

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

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"Wipe Out German Trade in America!"

MUST TAKE POSITIVE STEPS TO ANNIHILATE IT EVERYWHERE, DR. PRATT URGES COTTON MANUFACTURERS

A PLEA for the complete annihilation of German trade in America was made by Dr. Edward Ewing Pratt, vice-president of the Pacific Commercial Co. and formerly chief of the Bureau of Foreign and Domestic Commerce, at the meeting of the American Cotton Manufacturers' Association, at the Biltmore, on May 2nd. He declared that "even to-day in this country, after more than a year of war, enemy concerns are permitted to exist and do business." The speaker cited the case of the dyestuff industry, where German distributors are still selling dyestuffs and endeavoring to preserve German trade interests.

He called upon the business men present to take positive steps to annihilate German trade machinery and ended with the following appeal:

"Men, this business of wiping out German trade is our business. It is the business in which we are best fitted. Let us realize the importance of it. Let us accept no reasons, however plausible, as to why German trade machinery cannot be annihilated. Lack of knowledge, inadequate laws, red tape, administrative inefficiency, must no longer interfere. German trade must cease to exist."

Excerpt from Dr. Pratt's address follows:

"The point that is usually overlooked is that this trade war is not something to come, but is now upon us. We are now just as much engaged in a trade war with Germany as we are in a military and naval combat, but, unfortunately, we have entirely failed to recognize this fact, or adequately to mobilize or prosecute this trade war. In consequence the organized program for the trade war is more delayed and more ineffective than our lamented aeroplane program, and, as in other parts of our war program, our long-suffering allies are carrying the burden.

"The worst of it is that there seems to be little or no recognition on the part of our business community of the significance of a trade war, or of the part they are prepared to take, and can take, in winning the war. Much less is there any realization at Washington of the tremendous offensive weapon that we have ready at hand, but which lies unused; even worse than unused; the effectiveness of this weapon is being seriously impaired through neglect and even by willful if unthinking, sabotage.

"If we can definitely deprive the German commercial party of the hope of regaining immediately her lost trade, we will deprive them finally and completely of the possibility of a commercial victory in any sense of the word. If we can impress on the German commercial party the fact that German trade machinery is definitely and completely destroyed, we can withdraw to a very large extent the enthusiasm and

the hope of victory of the commercial party in support of the war. This trade war, then, here and now, is a real belligerent measure.

"Even to-day in this country after more than a year of war, enemy concerns are permitted to exist and do business. Some of these have been subjected to a thin coat of whitewash administered by the Custodian of Alien Property. But their organizations exist, they continue German to a very considerable degree, in sentiment and in personnel, and will be ready to go out on behalf of Germany when the war is over, if, indeed, they are not doing so now. The installation of a representative of the Alien Property Custodian is not enough. The affairs of every German concern should be wound up, the property sold outright to Americans, and the name abolished. But, more important, a new organization, an American organization, should take its place.

"There is no need for me to tell a group of textile men that German trade is masquerading in the guise of American trade. I have only to point to the dye business, and to ask if the German distributors are out of business, or are they holding on for grim death, hoping for the end of the war when they can flood our market with German dyes, and stifle our young and growing dyestuff industry. Only last week the representative of a concern now changed in name but in fact the successor of one of the German dyestuff distributors, offered a concern in this town dyestuffs under their own, the German, trade name. Why, I ask the Alien Property Custodian, have firms, once completely German, still openly so, and even now endeavoring to preserve German trade interests, been permitted to go on and do business; why has the Alien Property Custodian permitted the change of a name to purify a German concern, reeking with plans to further German trade interests now and after the war?

"We must destroy German trade not only in this country, but abroad, especially in the few still remaining neutral countries German trade must cease to exist."

Artificial Daylight Produced By Chemically Treated Glass

AMONG the exhibits at the recent Textile Show of interest to all concerned in the handling of dyed fabrics or the matching of colors, was one of a new glass of American manufacture which it is claimed will so filter artificial light of any kind that it takes on the properties of true daylight. The one fact worthy of mention about this glass is that it is not a moulded glass, and herein lies its value. A moulded blue glass gives off blue light, which is not a true daylight, and no colors or combination of colors have been found that make it possible to make a moulded glass that will give off true daylight. It is absolutely necessary that blue be eliminated in any glass that is to rival the day in its light-giving power.

This new glass has the colors on the surface and they are put there in a most interesting way. Clear crystal glass is used and is put in a kiln which is raised from zero to 668 degrees F., which opens the pores of the surface of the glass to a depth of about 1-64 to 1-92 of the depth of the glass. At this point there is injected into the kiln with a gun under pressure the basic color, which is flooded on the surface of the glass, the surface pores of which have been opened. After the basic color has been flooded on the surface the temperature is dropped to zero again, closing the pores and making the glass ready for the next operation.

The second operation is like the first with the exception that the glass in the kiln is raised only to a temperature of 234 degrees F., which opens the pores of the glass to a less depth than the first operation. A mixing color is then flooded over the surface and above the basic color which was flooded on during the first operation. After this is done the glass is again brought down to zero, which closes the pores again.

The third and final operation is then carried out. The glass is put into the kiln again and the temperature raised to 150 degrees F., which opens the pores but to a lesser depth than the first or second operation. With the

pores open a third color called the finishing color is flooded over the surface and the temperature dropped again to zero, thereby finishing the glass.

With the melting point of glass between 1,200 and 1,400 degrees F., it can be seen that the glass in the kiln is never melted, the whole idea being to open the surface pores enough to allow them to take up some of the colors that are flooded over the surface. The cooling processes close the pores which hold the colors in their place.

This process in itself would be an achievement, but there has been invented a cold process for doing the same thing, and this makes the invention doubly valuable.

In the cold process the glass is put under force and a solution of acid and a mineral is flooded over the surface, which makes one of the minerals in the glass soluble. At this point the basic color is puffed over the surface, which has been opened to a very limited extent. After the basic color is puffed on the surface, a wash is added which neutralizes the acid, after which it is taken off and the surface dried.

The process is then repeated with a weaker solution of acid and a mineral, and again one of the minerals in the glass is made soluble, thereby allowing a mixing color to be puffed over the surface just over the basic color added during the first operation. A second wash is added to neutralize the acid solution and the surface is dried again.

The third and final operation consists in flooding the surface with even a weaker solution than was used in the second operation, and, with the pores open, puff on the surface a finishing color, after which the pores are allowed to close, retaining the color that was puffed on. A third wash is then used which neutralizes the acid, after which the glass is dried. It is then ready for use.

The principle of this new glass is that it contains the colors that are necessary to neutralize the yellow rays to be found in artificial light, thereby producing true daylight. The colors necessary to correct the spectrum for nitrogen and tungsten lamps are added during the three processes. Both the hot and cold process produce the same results and the same colors are used in both methods, the only difference being in the method of application.

This new glass has many uses, and it is predicted that it will soon take the place of moulded glass to a large extent, and also be used for work for which moulded glass is impracticable. It is impossible to make a thin moulded glass, and for some uses a thin glass is necessary. And the process used to make this new glass can be used to produce any color of glass, with the result that thin glass of any color can now be produced.

It can readily be seen that if the glass measures up in practise to the standards which it seems to meet in the demonstration shown at the Textile Exhibition it will prove of very great value to dye houses which are constantly called upon to match colors where true daylight is not readily obtainable.

It would seem that this invention, if all that is claimed for it is true, should prove of very decided benefit to the dyestuff industry.

The Bay State Color & Chemical Co. has been incorporated under Massachusetts laws to succeed the Bay State Chemical Co., the change being necessitated through the company's association with the manufacture of aniline colors. The officers of the new company are: Edward J. Feeley, president; John J. Collins, vice-president; Percy L. Hinds, secretary; Frazier L. O'Leary, treasurer. The company's office is at 38 India Street, Boston.

Sixty-six Shades in New French Color Card

Claude Freres' Winter List Covers Wider Range Than Latest American Card

Containing, altogether, 66 different shades, the new color card of Claude Freres for the coming fall and winter season, has just arrived in this country. The first impression of the color card is that of variety in shades, both as to the range and the difference between the values of the lighter and darker extremes; the other impression is the richness of the shades. Compared, in a general way, with the 1918 fall season card of the Textile Color Card Association which, moreover, has only 44 shades, it appears that the American shades are, as a whole, much more somber, while in the opinion of some critics, the French shades are richer and purer. Of course, it remains an open question whether the American card boiled down to a smaller number of shades and thus offering less opportunity for mistakes is more desirable at the present than the more extensive French showing.

The first run in the new French color card is a range of six shades, starting with a bright sharp pink (not found either in the American Standard Color Card nor in the American 1918 fall card), and ending with a very dark garnet. Some of the shades between would correspond very nearly with the scarlet and garnet of the Standard Card.

The second range of six gray shades in the French card, called raton, begins with a shade closely resembling the pearl gray in the Standard Card and runs into dark shades which take their place between the colder grays and the fur shades of the American season card. The darkest shade in this French range is very similar to the one called rodent in the American season card.

Next comes a run called "castor" in the French card. The base of this range is like the "champagne" of the Standard Card, the darkest ones corresponding to the "wren" of the American season card.

This is followed by "lumiere defuse," three blues of remarkable brightness not found in the Standard or season American cards. The darkest shade is similar to gentian blue.

Another series of six blues, called "escadres," begins with the "national" blue of the Standard Card, going over into shades corresponding to the "marine" and navies of the American season card.

"Cacao" is the name in the French card of the next following series of rich browns, corresponding to "olive brown," "tobacco," and "chestnut" in the Standard Card.

A run of six shades, called "rouille," begins with a peach shade, which is quite different from the "apricot" in the Standard Card. This range is entirely missing from the American season card, its darkest shades resembling "terra cotta" and "mahogany" of the Standard Card.

Under the name, "indiens," three shades follow in the French card, not

found in the American season card of the fall, 1918. The middle of the three shades is not unlike the "burnt orange" of the Standard Card, although not as reddish as the latter. The darkest is a brilliant golden brown.

The range called "iris" in the French card contains six shades, the darker ones being quite well matched by the "violet," "petunia" and "grape" of the American season card. The palest French color in this range is not found on the American cards, it being only a lighter shade of violet.

The only green on the French card is represented by three shades, called "malachite." The lightest shade in this range is brighter and more intense than the greens of the American cards. The middle shade, however, could be compared with "myrtle" in the American season card, although the French shade has a more bluish cast.

"Eclats" in the French card stands for three bluish grays, not found in the American cards. The two darkest of this series could be approximately described as the "slate" and "graphite" of the Standard Card, with a bluish caste.

The darkest shade of the three called "broussailes" in the French card is somewhat like the "moss" in the Standard Card but considerably deadened with gray. The other two members of this French run are only lighter shades of the one just mentioned.

"Autrefois" in the French card is not found in the American season card. The darker shades are odd, resembling the liver color. The palest shade is very much like the "blossom" from the Standard Card but not as brilliant. The two darker shades could be approximated by the Standard American "ashes of rose," deadened with gray.

"Azalee' in the French card describes by its name the character of three pink shades. These cannot be matched from any American cards.

Under the name of "pieds d'alouette," follows a range of three blues. The palest is somewhat stronger than "light blue No. 4" in the Standard Card. The second shade in this French range corresponds to "Saxe blue" in the Standard Card, the darkest being similar to the "sapphire" of the Standard card with, perhaps, a little addition of gray.

"Tempete" in the French card stands for three grays. The lightest of these is like a paler edition of the American Standard "nickel," and the darkest like the Standard American "slate," only somewhat lighter.

American Colors Sometimes Too Fast

A SOMEWHAT humorous incident, illustrating that it is sometimes a disadvantage to have American-made colors extremely fast to washing when used for purposes for which they are not intended, occurred recently in the Grand Central Terminal Office Building, New York.

It appears that Fred Wetzel & Co., Incorporated, dealers in dyestuffs, were expecting the receipt of a barrel of American-made safranine. When this barrel was delivered the cartman in charge, without making inquiries as to the exact place of delivery, started out to take it to Mr. Wetzel's office. He rolled the barrel the entire length of the marble-floored corridor and only after he had reached the door discovered that a small quantity of the dye had leaked out and that the corridor had a trail of reddish powder. The janitor, not being familiar with the character of the composition, attempted to clean it up with a pail and mop, the result being that the entire corridor, which extends for 200 feet or more, was stained a beautiful pink, which has so far defied every effort at removal. In this case, at least, we imagine that Mr. Wetzel would have been glad to have had his safranine a little less fast to washing, as we understand he has had some difficulty in adjusting the matter with the New York Central Railroad Company.

Another moral which may be drawn from this story is that manufacturers of dyestuffs should see to it that their containers are absolutely tight. There is no question but that the gradual leaking of concentrated dyestuffs is very likely to cause serious damage to any other goods with which a faulty package may come in contact.

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MYRON DREW REESER, Managing Editor

Creative American Research Essential

THE success of Germany in so completely covering the ground in producing the entire range of synthetic compounds derived from coal-tar crudes, which science has shown to be adapted to practical human wants, has been the chief source of that country's dominance in the industry. It has been seconded by the magnificently organized facilities for research, installed in the German color-works as well as in the German universities and technical schools. This machinery must be duplicated in our own country.

It is most encouraging to note the generous provision made by the leading factors in our young industry, to equip adequate research laboratories, and assure the healthful growth on American soil of this most fascinating and complex branch of human activity.

It is fully recognized that the permanence and commercial effectiveness of the American dyestuff industry will depend largely upon the ability of our tinctorial chemists to forge ahead, to blaze new trails in a forest of practically unbounded possibilities.

A servile, oriental adaptation and imitation of the achievements of European chemists will not suffice. We must train men to be leaders in this field, equal in inventive power, versatility and grasp of the situation to their fellow Americans who have accomplished so much in electrical, mechanical and metallurgical industries.

Publicity for American-made Dyes

WE understand that the leading manufacturers of American dyestuffs—some of them independently and some of them through the newly formed American Dyestuff Manufacturers' Association—have in contemplation an educational campaign which will teach the women of the country the merits of American colors and dissuade them from the mistaken and widely held opinion that only foreign-made colors give satisfactory results.

An interesting effort in this direction is one which will shortly be put into operation by the National Aniline & Chemical Company. They prepared, as mentioned in previous issues of the REPORTER, a very complete exhibit of their products for use at the recent Textile Exhibition in New York City. This Exhibit included, it will be remembered, not only samples of their various products but also a number of comparative dyeings of German colors versus American colors of similar type, the comparative dyeings having been submitted to the same tests for fastness to light, washing, etc. There was also a complete laboratory wherein actual dyeings were made from their own and pre-war colors.

This exhibit excited such general popular interest at the Textile Show that the Company has now determined to give it wider publicity than was there afforded. They have accordingly arranged with Jordan Marsh & Company of Boston to place the entire exhibit, including the laboratory, on display in that store for a week or so, beginning May 15th. It is also expected that following the appearance of the exhibit in Boston it will be moved to other large cities and displayed in prominent department stores where the buying public will have an opportunity to judge for themselves of the real merits of American-made colors. It is also probable that Dr. Louis J. Matos, of the National, will accompany the Exhibit and thus be in a position to answer intelligently any inquiries which consumers may make.

The Reporter believes that this is a step in the right direction and that similar methods might be adopted by other concerns, or better yet, by several of them working in common.

New and Cheap Process Reported for Manufacturing Toluol

It is reported from Washington that one Louis Band Cherry, an electrical engineer of Kansas City, Mo., has submitted to the Ordnance Division of the War Department an electro-chemical process, which he claims to have perfected, by which toluol can be manufactured and sold profitably at not to exceed ten cents a gallon.

If Mr. Cherry's process proves to be commercially successful it will have a pronounced influence on the cost of the manufacture of many dyestuffs, as toluol is one of the most largely used dyestuff bases.

Correction

In our issue of May 6th there appeared a description of the exhibit of Frank Hemingway, Incorporated, at the Textile Show, in which certain titles were accredited to some of the gentlemen in charge. It appears that the editor was in error in using these titles and we wish to take this opportunity of correcting any false impression that may have been created.

New Dyestuff Plant

The American Aniline Products Co., 80 Fifth Avenue, this city, has purchased the plant in Nyack, N. Y., built by the Peerless Finishing Works, and more recently owned by the United Piece Dye Works. The plant is to be used by the American Aniline for the manufacture of aniline colors.

Dyestuff Testing in the Textile Industry

By Edward Wallace Pierce

Chief Chemist of the U. S. Conditioning and Testing Company.

PRIOR to the war nearly all tests of dyestuffs were made by the laboratories connected with the large dealers, most of whom were the agents of foreign companies. The expense of these laboratories was charged against the costs of distribution, which really meant that the consumer paid in the end.

Hand in hand with the testing went a technical service which appeared to be gratuitous, the visits of the dyestuffs demonstrator solving many of the problems of the dyer. It finally came about that the old-fashioned dyer became more scarce and in his place we found younger men who were accustomed to depend on the dealers. Many were unable to match their shades from straight colors, preferring to have their samples matched for them, thus putting the dyehouse practically in the hands of those who sold them the dyes.

A few of the more progressive mills maintained laboratories of varying degrees of efficiency and instituted competitive systems of buying. Some of the best of these laboratories were equipped thoroughly and well repaid the expenditure, but many were operated indifferently, or were in the charge of the wrong men, and only served to maintain a constant hostility with the dyer.

When the speculation period started, shortly after the war, the situation was a most unfortunate one for the consumer, who had no means of determining the value of his purchases. The dyers were forced to adopt new methods and make substitutes and gradually acquired again the resourcefulness that had been a part of the day's work of their predecessors.

The new American factories slowly advanced their output, but on account of various difficulties it was particularly hard to maintain deliveries in accord with a constant standard. The dealers and brokers, selling what was left of old foreign dyes, also found difficulty in obtaining or delivering a constant supply of uniform goods. The result of all this was an endless series of disputes, without a court to dispense justice. As the state of affairs was one particularly affecting the textile industry, and capable of being handled in the same manner as other textile tests, arrangements were made to conduct dye tests from an impartial point of view and, if possible, to prevent a few of the objectionable features of the dyestuff business.

The experiment having proved itself practical, it seems to be to the general interest of the textile as well as the dyestuff industry to review the methods used by the United States Conditioning & Testing Company in order to stimulate testing both among the mills and the new manufacturers and dealers. It is hoped that some day some authoritative body will designate definite and arbitrary methods that all may follow; but until that time comes individual methods will be used. It would be desirable if the Dyestuff Association, the Bureau of Standards or the Bureau of Chemistry would make it a matter of interest and plainly outline some standard methods of testing and thereby eliminate the controversies that may arise through the work of different operators.

The methods that follow are the resultant of ideas gathered from many sources and are those generally in use in dye testing laboratories. It is not the general system that needs standardizing but the many special cases that vary from the general rule.

The first essentials in dye testing are good water and clean, white textiles, then a general cleanliness throughout the entire operation. River water is

bad, particularly with direct cotton dyes, basic dyes, alizarines and extracts. It has a tendency to form lakes which readily wash off and diminish both the strength and brilliancy of the dyeing. Of course spring and well waters are worse in this respect than river water, and city supplies now often show the results of various chemical treatments that visibly affect dyeing. Hypochlorites and copper salts are quite likely to be present in sufficient quantity to cause variation in the results. Water treated by zeolites is safe and gives entire satisfaction.

The yarns or fabrics used for the tests should be obtained in large lots to insure uniformity and should be of a good grade. Worsted is preferable to wool and in the case of cotton combed peeler is generally used. Silk in the form of a light colored spun silk is likely to be more satisfactory in every way than the best grade of organzine or thrown silk thread.

Loose cotton may be used, but combed sliver is better, and worsted tops are preferable to raw stock, as level shades are necessary for comparisons. Cloth samples should be quite light in weight because the absence of bulk in the small dye test gives rise to differences in penetration. The less penetration the heavier will be the surface color.

Tests are best carried out on a metric basis and the 10 gram skein is the standard. No account is generally taken of the moisture content of the fiber, but whenever a lot of skeins are wound they should be examined and weighed before dyeing, separating the correct weights from the light and heavy and correcting these before use.

Dyeing operations are best conducted in porcelain beakers or pots on account of the comparative ease with which they may be cleaned. Enameled ware will soon become pitted and yield traces of iron to the hot liquids and cause unevenness or dark stains. Pyrex glass would be satisfactory if a type of beaker could be obtained that was sufficiently heavy to withstand the frequent handling. The American porcelain, made by the Coors factory, is proving as satisfactory in every respect as the imported varieties used before the war.

Smaller laboratories which do but little of this kind of work generally dissolve their dye samples in the proportion of 1 gram to 1 liter and then measure out the quantity needed for each test. When the daily number of samples runs into the hundreds, and most of the samples are small, it is not possible to take care of so many different solutions without a great loss of time and possibility of confusion. In such cases the quantity to be dyed is weighed directly from the dry sample. The error is minimized by the use of balances sensitive to at least 1-10 milligram. The dye sample must be uniform and representative of the larger lot, as many errors occur through careless sampling.

Any abnormal dryness or dampness, or specks and chips of foreign matter, will affect the strength of the dye accordingly. Sometimes the sample contains a lump of either reducing matter (salt, dextrine, etc.) or lumps of con-

centrated dye which later becomes crushed and mixes with the remainder and causes an error which is no fault of the tester. Any time there is a visible lack of uniformity in the dye the sampling should receive particular attention.

The dye pots are heated uniformly in a water bath. Water alone will not raise the temperature high enough to exhaust some dyes, hence other materials are used. Glycerine is the best, but the present price makes it too expensive. Red engine oil, corn oil, paraffin, and other oily substances are available but the effect of an accidental splash of water in the hot oil is likely to be dangerous. Calcium chloride has one serious drawback, shared with all other salts, in that the electrolytic action destroys the solder of a copper bath and leaks soon occur. This feature is overcome by the use of baths made of boiler plate with oxy-acetylene welded joints. The greater weight of the iron prevents sagging of the top and bottom and the chemical action of the salts on the iron is prevented by having a quantity of metallic zinc always in the liquid.

After numbering and recording the samples, the dye baths are prepared, conforming as nearly as possible to practical conditions. A trial dyeing always has one feature that must remain a point of difference and a source of criticism of the practical dyer—the proportion of water to the goods dyed. It is not possible to dye a 10-gram sample in as short a liquor as a 100-lb. lot, and consequently the shade of a dye test is always lighter than a practical dyeing. This, however, does not affect the comparison of two lots of the same dye, for if the conditions of time, temperature and concentration of bath are equal the shades will be proportionate to the strength of the dyes. The average dye test on a 10-gram sample is made with a bath of 500 cc. for 1 hour at a boil or whatever other temperature is demanded by the dye in question.

Methods for Different Dyes

The general methods for the common classes of dyes are as follows:

ACID COLORS ON WOOL.—1 or 2 per cent. dyestuff for colors; 5 per cent. for blacks; 5 per cent. Acetic Acid, or 3 per cent. Sulphuric Acid; 10 per cent. Glauber Salt. Dyed for 1 hour at 200 degrees F.

ACID COLORS ON SILK.—¼ of dyebath is boiled-off liquor; 2 per cent. Dyestuff; 5 per cent. Acetic Acid (or more if necessary). Dyed at 180 degrees F. for ½ hour.

Direct cotton dyes and chrome dyes are also tested on silk in the same way. Basic dyes on silk will require much less Acetic Acid.

CHROME COLORS ON WOOL.—Dyed as Acetic Acid dyes, then treated with ½ per cent. Bichromate of Soda and run 20 minutes longer.

ALIZARINES AND CHROME COLORS ON WOOL.—Mordant, 2½ per cent. Bichromate of Soda; 2½ per cent. Formic Acid; boiled until reduced to a green color. Dye bath, 1 to 5 per cent. Dyestuff, entered at 140 degrees F. and slowly raised to 200 degrees F. and continued until bath is exhausted.

DIRECT COTTON DYES ON COTTON.—Dyed at a full boil for 1 hour with 20 per cent. salt; 2 per cent. Dye for colors; 5 per cent. for Blacks.

BASIC DYES ON COTTON.—Mordant, 5 per cent. Tannic Acid, boiled 1 hour and worked in cooling bath 3 hours, wrung out and fixed with 1½ per cent. Tartar Emetic at 120 degrees F. for 20 minutes and rinsed. Dye bath, 1 per cent. Dyestuff; 5 per cent. Acetic Acid or Alum. Dye at 160 degrees F. for ½ hour. (Auramine must not be dyed at over 140 degrees F.)

SULPHUR DYES.—2 to 5 per cent. Dyestuff for Colors; 10 per cent. for Blacks; equal weight Sodium Sulphide conc.; 1 per cent. Caustic Soda; 50 per cent. Common Salt. Dye at full boil for 1 hour, wring, allow to oxidize in the air, rinse thoroughly, wash in hot soap, rinse and dry.

To the exhausted dye bath add one-half the original quantity of Sodium Sulphide and without the addition of any more dye exhaust the liquor with a new skein, adding 25 per cent. more salt at the end of the first half hour. The second skein is treated as the first and the two together represent the only practical way of testing sulphur dyes.

ALKALI BLUES.—1 per cent. Dyestuff; 5 per cent. Borax. Dye at a 200 degree F. for 1 hour on either wool or silk, wring without rinsing and develop in a cold bath containing 5 per cent. Acetic Acid.

In all cases the skein or cloth should be thoroughly wet out and scoured before entering the dyebath and turned frequently during the dyeing operation.

While the mordants for chrome, extracts and basic dyes are made up in quantities to insure uniformity, and kept in a damp condition in stoneware jars, it has been found that it is very difficult to make two lots of tannin-antimony mordant absolutely identical. For this reason basic dyes are tested on spun silk whenever possible. The ordinary chrome mordant is also quite variable and preference is given to a completely reduced chrome mordant having no oxidizing power.

The use of this non-oxidizing mordant has made possible a more definite test for logwood products. It is well-known that all logwood preparations contain both oxidized coloring matter (Hematine) and unoxidized coloring matter (Hematoxylon). Some dyers require a high percentage of Hematine while others want less Hematine and more Hematoxylon. The method of dyeing on a Chrome and Tartar mordant yields a blue-black with all soluble Logwood preparations but gives no idea of the extent of the oxidation. The following method, however, shows approximately the amount of each ingredient. It is approximate, rather than exact, because the very nature of Logwood baffles exactness, as it oxidizes somewhat while the test is being made.

A single chrome mordant is prepared, for both parts of the test, which represents only Chromium Salts and contains not the slightest trace of Chromic Acid.

MORDANT.—3 per cent. Bi-Chromate of Soda; work the wool at a boil for 15 minutes, then add 5 per cent. Sulphuric Acid; boil for one-half hour longer.

This results in practically a complete fixation of all the available Chromic Acid on the wool fiber. The wool is then introduced into a fresh bath containing about 10 per cent. Bi-Sulphite of Soda, 5 per cent. Sulphuric Acid and worked for 20 minutes or longer at 100 degrees F., whereby the Chromic Acid is absolutely reduced to Chromium Salts. The skeins are rinsed thoroughly in water only, and kept in a wet condition.

DYE BATH.—5 per cent. Hematine Crystals or other Logwood preparation. Dyed at 200 degrees F. for one hour, the skein rinsed so that the rinsing runs back into the dye bath.

This first dyeing on the green, non-oxidizing mordant utilizes only the fully oxidized Hematine that exists in the sample and leaves the un-oxidized Logwood in the exhaust.

A second dyeing is then made in the exhaust of liquor as follows:

Add to the bath one-half per cent. Bi-Chromate of Soda and immediately

add another skein mordanted as above. The residual Logwood is then also converted into Hematine and dyes a shade which varies in proportion to the amount of Logwood which was originally in the un-oxidized condition. After one hour's boiling this bath is also exhausted completely and the entire amount of coloring matter is divided between the two skeins in direct proportion to the degree of oxidation.

Comparing the Samples

After dyeing, rinsing and drying the temporary tags are replaced by the permanent tickets and a comparison of the dyeings made. Most colors after leaving the drier are altered in shade. This is not a permanent alteration, as a rule, but is due to the absence of moisture. As soon as the fibers have regained their normal moisture the proper color will return. Some dyes, being very sensitive to acids and alkalies, may show irregularities and streaks. The slight amount of sulphurous and other acids in the air will darken Congo and other Direct Reds, but a few minutes in a closed box with a piece of cotton moistened with Ammonia will restore the color. Metanil Yellow, Azo Blue, Chrysoidine and Bismarck Brown are also dependent on their acid content for their shades. Bordeaux Extra on the other hand is easily affected by Ammonia and alkalies in general. These conditions being adjusted, the samples may be compared by daylight, from the north sky, or under a daylight lamp.

It is not safe to simply estimate differences in strength by comparison of two dyeings, but a series of dyeings in different strengths should be made and a selection of the two that match will determine the strength within 5 per cent. The figure 5 per cent. seems to be the limit of accuracy of dye tests, as the eye is seldom able to distinguish a less difference. Comparison may only be made between dyeings made at the same time. Tests made at a prior date may have undergone a change or have been affected by some influence not present in the later test.

Where greater exactness is required, and where quicker results are wanted, a colorimetric method is preferable. The first essential to a colorimetric comparison is that the two samples to be compared shall be identical in shade and composition. The color of the solution has no direct bearing on the shade the dyestuff will yield on fabrics but with straight products the depth of color of the solutions is in direct ratio to the strength of the dye. The first step is to ascertain whether the dye is a straight product or a mixture. Two methods are in use, either sprinkle lightly on a piece of damp filter paper, or white blotter, or on the surface of cold water. The first, when dried, gives a permanent record, but the second is more convenient. Sometimes Alcohol is used instead of water for special cases.

With colorimetric tests we must always prepare solutions at the start and a concentration of 1 gram to 1 liter is quite convenient. In making the solutions we also observe the relative solubility of the samples and when all the dye has dissolved a drop of each on filter paper will reveal the presence of any suspended insoluble matter.

Simple colorimetric comparisons are made in Nessler jars or graduated cylinders, by daylight. The jars must be equal in diameter. This is shown by the graduations being at the same point on each pair. A set of twelve matched jars for such tests has been very difficult to obtain but it is not difficult to select pairs from any large stock. A graduated pipette is used to transfer a quantity of the solution to the jars. Only enough is used to give a distinct color, not a deep shade. The type is diluted until the jar is about one-half full, then the second sample is diluted only enough to match the depth of the first color.

As the reading of the test is much affected by many outside influences, such tests are best done on a shelf across a window with a ground or opal glass screen as a background. A little practice will enable anyone to judge when the two solutions match. It is well to have a series of colored glasses to check up the reading made with the naked eye. A set of the Wratten light filters, mounted on glass, gives a complete range and enables the matches to be made with an accuracy of about 2 per cent. When the solutions match, the strengths of the dyes in question are in a direct ratio to the volume of the solutions. For example, a match was made with the type diluted to 360cc. and Sample X to 280cc. Dividing 280 by 360, and multiplying by 100, we get 77.8 and report that type equalling 100, Sample X equals 78 or is 22 per cent. weaker than type.

With such colorimeters as the Campbell-Hurley and the Kobel, more dilute solutions are used and these are measured by adjusting the depth of the solution that must be placed between the eye and the light in order to match each other. As the observation is made through an eye-piece, and the field is a circle divided in halves, it is easier to determine when an exact match has been obtained than by means of the open cylinders. As both these instruments have been thoroughly described many times it is hardly necessary to go into further details. A modification of the Campbell-Hurley is necessary. The plunger case in the stock form of this apparatus is connected with the right hand jar by a rigid glass connection without joints and makes the instrument difficult to take a part for cleaning after each test. A flexible rubber tube is substituted and makes the operation more simple. The Wratten light filters are useful here also for detecting any slight differences that may escape the unaided eye.

The indentification of dyestuffs is a subject that covers too large a field to include it in this paper. There are many books of reference and systems in use, but the simple tests given in the Schulz & Julius tables will be found quite helpful. The systems outlined by Arthur G. Green and Mulliken are more complete, but depend on the use of Titanous Chloride and Rongalite C. As these are now almost impossible to obtain, the usefulness of the systems is in temporary suspense.

Micro-chemical methods, as sug-

gested by Chamot, offer many possibilities in the dyestuff field and may develop in the near future. Spectroscopic methods of identification require operators and apparatus beyond the reach of the ordinary laboratory and the instruments are now difficult to obtain.

Tests for Fastness

Dyed samples should be put through a series of tests for fastness to the various influences. There is a need for a standard set of tests at this time. Government goods are tested according to certain specifications, which are needlessly severe for general use. Where a test requires a strictly negative report there is no difficulty, but where the fastness is of an intermediate degree it is now almost impossible to find two observers who agree.

Tests of fastness to light were discussed in a previous paper (*Textile World Journal,* Jan. 12, 1918), in which an ultra-Violet lamp was described. There is still a need for a simple means of measuring the intensity of the radiation. The Bureau of Standards recommend the proto-electric cell. The near future may produce a commercial type of this, and thus open the way for a more definite expression of the fastness of dyes. There will always remain, however, a difficulty of comparing the fastness of different depths of color on account of the inability of the eye to determine when fading begins and how far it has proceeded.

Dyestuff Standardization

There has been some discussion of dyestuff standardization and much confusion as to what is meant or expected. There are two kinds—a strictly scientific method which will report the actual purity of each dye just as heavy chemicals are described, also a practical method which only requires that each manufacturer shall put his products on record and make deliveries according to the standard he has made for himself. Both kinds of standardization will require the adoption of a set of rules for testing. Until uniform methods are adopted there will be some confusion. It can only be hoped that the foregoing outline of methods in use will make it easier for producer and consumer to understand each other. There need be no dispute where there is an understanding, and if the consumer uses the same method of making a test as the producer the findings will agree.

The American manufacturers have declared themselves against the old prewar methods of business and when the war is over every bit of independence the consumer has gained will aid in keeping the American textile industries free from foreign influence.—*Textile World Journal.*

Exhibitors at Textile Show

(*Continued from last week*)

R

Reliable Globe Textile Shrinking Corp., New York; Rogers Fibre Co., Boston; Louis Roessel & Co., New York; Reeves Pulley Co., Columbus, Ind.; Rockland Silk Co., New York; R. U. V. Co., New York.

S

L. Sonneborn Sons., Inc., New York; Surpass Chemical Co., Inc., Albany, N. Y.; Saco-Lowell Shops, Boston;

Scott & Williams, Inc., New York; Silk Publishing Co., New York; S. K. F. Ball Bearing Co., Hartford, Conn.; Smith, Drum & Co., Philadelphia; Stafford Co., Readville, Mass.; Stamford Extract Manufacturing Co., New York; W. R. C. Smith Publishing Co., Atlanta, Ga.; Smith & Cooley, Stafford Springs, Conn.; Steel Heddle Manufacturing Co., Philadelphia; Stein, Hall & Co., New York; Sterling Color Co., Inc., New York; Southern Textile Bulletin, Charlotte, N. C.; Alfred Suter, New York; Swan & Finch, New York; Signode System, Inc., Chicago, Ill.; Southern Textile Machinery Co., Paducah, Ky.; Sweater News, New York; Stoughton Mills, Boston; South Acton Woolen Co., Boston; R. T. Sullivan & Co., Newton Lower Falls, Mass.; John T. Slack & Co., Springfield, Vt.; Screw Machine Products Corp., Providence, R. I.; Stillwater Worsted Co., New York.

T

C. J. Tagliabue Manufacturing Co., Brooklyn; Takamine Laboratory, Inc., New York; W. O. & M. W. Talcott, Providence, R. I.; American Textile, Boston; Textile Colorist, Philadelphia; Textile Finishing Machinery Co., Providence, R. I.; Textiles Co., Boston; Lewis E. Tracy Co., Boston; Transmission Ball Bearing Co., Buffalo, N. Y.; Truck & Tractor Co., Inc., New York; Tillotson Humidifier Co., Providence; Textile World Journal, New York; Templeton Manufacturing Co., Cambridge, Mass.; Talbot Mills, North Billerion, Mass.; Textile Color Card Association of the United States, Inc., New York; Taunton Wool Stock Co., Taunton, Mass.

U

U. S. Conditioning & Testing Co., New York; U. S. Gutta Percha Paint Co., Providence, R. I.; U. S. Government Exhibit, Quartermaster Corps, Bureau of Foreign and Domestic Commerce, navy clothing exhibits, Department of Agriculture; Universal Winding Co., Boston; U. S. Ring Traveler Co., Providence, R. I.; Underwear and Hosiery Review, New York.

V

Veeder Manufacturing Co., Hartford, Conn.; Victor Ring Traveler Co., Providence, R. I.

W

Wardwell Braiding Machine Co., Central Falls, R. I.; W. J. Westaway Co., Ontario, Canada; Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa.; Whitin Machine Works, Whitinsville, Mass.; Woonsocket Machine & Press Co., Woonsocket, R. I.; Charles D. White, Uncasville, Conn.; J. H. William Co., Millbury, Mass.; Jos. M. Wade Publishing Co., Boston; Warner Manufacturing Co., New York; Watson-Flagg Engineering Co., New York; Williamsburg Chemical Co., Inc., Brooklyn; Thomas H. Wilson, Inc., New York; Worumbo Co., New York; West End Thread Co., Millbury, Mass.; J. K. & L. S. Wiener, New York.

Y

"Ye Olde Time Spinning," Newton Center, Mass.; Young Men's Christian Association, International Committee, Industrial Dept., New York.

Z

Zavon, Inc., Brooklyn, N. Y.

AMERICAN DYESTUFF REPORTER

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"Circulated Everywhere Dyestuffs are Used"

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British Manufacturers and the Dyestuff Crisis

How the Forehandedness of One English Firm Helped the Government

WHEN the war broke out Great Britain was at once cut off from the supply of fine chemicals, drugs and dyes obtained from Germany, constituting about nine-tenths of her consumption. It was not until eight months later that the United States faced a similar situation. The degree of enterprise shown by leading British houses, in promptly taking measures to obviate the impending shortage, was most admirable, and it has been continued, without interruption for three years. Possibly it was no more creditable than the corresponding effort, begun in our own land in 1915, and resulting in such a remarkable development of coal-tar chemistry during the subsequent two years.

It must, however, be borne in mind that the British struggle to create an independent artificial dyestuff industry was carried on simultaneously with the nation's gigantic effort to call into existence an army of millions, and wage warfare, on a scale hitherto unknown, almost at its very doors.

Not much has been related in detail of this struggle, but we know that it brought into play all that is finest in British character, in resoluteness and swift adaptation to novel and unforeseen conditions.

The *Manchester Guardian* recently outlined some of the experiences of one of the most prominent English companies engaged in the color industry, Levinstein, Ltd., of Crumpsall Vale, near Manchester. The recital is reproduced here as full of interest and of encouragement to American manufacturers in the same field:—

Immediately on the outbreak of the war, Dr. Herbert Levinstein, from his knowledge of the industry, foresaw that the War Office and the Admiralty would soon be in a very serious position unless the hitherto despised British dye manufacturing trade could rise to the occasion. All the dyes hitherto used for navy blue and military khaki came from Germany. Dr. Levinstein saw that the cutting off of German dyes was a serious matter from a purely military point of view. It is well known that you cannot really begin to train a soldier until you get him into uniform, still less, of course, can you put him in the field. Self-respect, discipline, and spirit are vitally helped by the uniform. This is universal experience, and the psychological reasons are not very obscure. Before you raise armies, therefore, you must have uniforms. For the woolen cloth of which uniforms are made, the

wool must be dyed before it is even spun into yarn, so that the almost first essential to the production of uniforms is the supply of dyes.

Three or four days after the war broke out Dr. Levinstein visited the War Office and drew their attention to these facts. He pointed out that the khaki dyes that had hitherto been used by War Office contractors came entirely, or almost entirely, from Germany. It was, however, possible to manufacture in this country khaki dyes both for cotton and wool, which, though different in character, would be quite as good and quite as fast as the German dyes. He offered to supply such dyes as quickly as they could be used, and the War Office accepted the offer.

Dr. Levinstein then went to the Admiralty, who were exactly in the same situation as to naval uniforms. The chief color used by the naval contractors had hitherto been indigo and a brilliant alizarin blue, obtainable only from Germany. He explained that he could not pretend to supply this dye, but that he could supply a navy blue dye as good and as fast as the German dye, which had already been used and found satisfactory by the Japanese navy during the Russo-Japanese war. This offer also was accepted.

It is important to observe that in this vital matter the initiative was not with the government, but with the private manufacturer, who from his technical knowledge realized the difficulty in which the War Office and Admiralty would find themselves before many months were over. To that initiative and foresight it is due that, enormous as were the armies we raised and equipped, the War Office never had any trouble in equipping them owing to delay in the supply of dyes. It was not a small undertaking that Dr. Levinstein had given when he promised to supply khaki and navy blue as fast as they were required. It meant a workship revolution and the initiation of a number of manufacturing processes which had never before been carried out in this country. Before the war the dyes offered had been manufactured successfully, but the intermediate products which were the raw material had been obtained from Germany. There was only in stock about six weeks' supply of these raw materials. For further supplies there was no resource but to manufacture on the spot. There were many difficulties and many mishaps, but the firm managed to get the intermediate products manufactured before the German supplies ran out.

It is not too much to say that if it had not been for this initiative on the part of the private manufacturer the War Office could not have been expected to discover the shortage of dyes and all that it meant for many months, and then more months would have gone by while experiments were being made and the manufacture not going. The inevitable result would have been to delay the equipment of Kitchener's armies. As it was, the production of these necessary dyes outran the production of fabrics by the cotton and woolen manufacturers. The surplus was enough to supply American contractors and practically all our Allies. The War Office placed large contracts for equipment with American mills, and the American manufacturers immediately replied that they could only execute the orders, if the Board of Trade would allow them to import the dyes from the British firm.

When the Belgian army was put into khaki, all the dye required was supplied within a week by the same firm. They also supplied within a week all the khaki dye demanded for the Australian army, and all the green dye for the Italian army, when Italy came into the war. The Russian army was equipped largely from America, and the British firm supplied the dye. It also supplied a very large part of the dye for the uniforms of the French army.

Only a manufacturer and a chemist can understand what this enormous increase of output must have meant.

Synthetic Indigo

Another pressing problem was that of artificial indigo. To many Admir-

alty and War Office contractors indigo is the one really satisfactory dyestuff.

A German firm had founded works at Ellesmere Port in 1907. It was equipped with plant for the actual manufacture of indigo, but the necessary intermediate product—phenylglycine—was imported from Germany and was not manufactured in this country at all.

When the war began the Board of Trade considered that the manufacture of synthetic indigo was so complicated that no one in this country was carrying it out. The works were therefore kept going under the German manager and for a time supplied a little indigo, but the output gradually came to a stop.

In August, 1916, the Ellesmere Port works were transferred to Messrs. Levinstein, with the duty of reopening the manufacture if possible. There were many difficulties. The scientific records of the works had been destroyed. Phenylglycine was not to be obtained, and before operations could be begun phenylglycine had to be made. Moreover, a new process for making it had to be discovered, for no chloracetic acid could be obtained for the ordinary process.

The problem was rapidly solved by the chemical staff in the research laboratory and the engineering staff in the factory. Within six weeks the first supplies of phenylglycine on a large scale were produced, and the manufacture of synthetic indigo was begun. This took place in November, 1916, and synthetic indigo came on the market in large quantities.

The plant has run continuously ever since and the present requirements of the country for synthetic indigo are being adequately met.

Novocain

Great Britain, like the rest of the world, was wholly dependent upon Germany for certain drugs of the highest importance in surgery and therefore in war. Among them the

local anaesthetic novocain and the anaesthetic trypaflavin.

On October 4, 1916, the National Health Insurance Commission asked for ten kilos of novocain, half to be delivered before the middle of November, and the balance by the end of the year. Already by the 31st of October, ten pounds of novocain were ready for delivery. This complicated manufacture was thus definitely established in this country, and novocain was produced in adequate quantities without dependence upon Germany, even for the intermediate product.

Trypaflavin

At the end of October there was a government demand for a few pounds of the new antiseptic trypaflavin. Although the scientific staff was working at high pressure, three chemists were taken off their ordinary work and a careful scientific investigation was made of both of the properties of this class of product and of the best way of preparing it on a large scale in a pure state. At the same time plans were taken in hand for the erection of a plant for its manufacture, which is of an extremely complicated character, involving a very large number of separate and distinct processes.

In March of this year a considerable quantity was put at the disposal of the Medical Research Committee.

Civilian Requirements

At the same time that military and naval needs were being met, as has been described, there was an enormously increased demand for civilian requirements. A dye famine threatened to come in a few weeks after the outbreak of the war.

The great textile industry would have been held up in a month or so if British manufacturers had not proved able to come to their help. Over one hundred different highly-complicated organic products had to be made at Blackley that had never been made in England before, and they had not only to be made, but had to be turned out regularly to meet a huge demand. Some idea of the size of it may be gained from the fact that the expansion of output entailed an expenditure of half a million pounds, and a great deal depended on the promptness with which the thing was done.

Only a chemical manufacturer can have any understanding of the magnitude of the task thus undertaken and successfully accomplished. There were about 900 dyes in use before the war. By conference between the manufacturers and the dyers this list has been reduced to 500 of the most necessary dyes, a figure which in itself is evidence of the extraordinary variety and extent of the regular civilian demand. Every one of these dyes is a complete chemical compound produced from a number of intermediate products, and these products have to be prepared with scientific exactitude. There is no insoluble mystery in the manufacture of these products, and any skilled chemist can make any one of them, given the time and the means. But it is a very big thing

to make them all in a hurry. It requires chemists and workers of great experience and knowledge; at any time the number of such men available in this country is not large. With the outbreak of war many of the younger chemists went into the army, and many more were engaged in making explosives for the War Office. It is bare justice to Messrs. Levinstein to say that they alone had the courage to attempt the manufacture of the innumerable intermediate products for the manufacture of dyes.

Nobody in England or in Germany probably would have predicted that such a thing could have been done, and done in so short a time. That a British firm should have had the courage to attempt it and the skill and energy to succeed without government help or subsidy is full of real promise for the future of the British aniline dye industry. We know now that we can manufacture aniline dyes and fine chemicals, from the tar upward, without any help from Germany.

Glove Dyeing

(*In answer to a request for a method for dyeing gloves we are reproducing the following, credit being given to the "National Cleaner and Dyer" and to "Mack," under whose signature it was published.*—EDITOR.)

To many a man in the cleaning and dyeing business the cleaning of colored gloves is a source of continual trouble and worry. This is due to the fact that colored gloves, especially if they are very dirty, become much lighter in color during the cleaning process. Those dyed in tans, browns and greys, the prevailing shades, are generally so affected. Gloves that are badly worn on the finger tips often appear to have lost all of their color on these places after having been cleaned. I believe that these articles, when returned to customers in this condition, cause much disappointment and that many of them are never worn again.

There are tints for coloring gloves to be had, and these give good results as a rule. However, it is possible for the cleaner and dyer to get very good results with the following preparations, providing he cares to go to the trouble to prepare them. By using this method, and with patience and practice, the cleaner will be able to tint many pairs of gloves in a short time and secure results that will please his customers:

Dissolve two ounces of Benzo Brown, four ounces of Diamine Yellow, two ounces of orange and one-half ounce of Gloria Black, or other good black, in one gallon of alcohol Boil the solution for a few minutes and pour into a large bottle which should be kept well corked to prevent loss by evaporation. This is the standard solution with which all brown and tan gloves may be tinted. The shade desired may be obtained by mixing the proper quantity of the stock solution with one part of alcohol and four parts of benzol. The solution should be brushed or sprayed on the gloves. Unless the alcohol and benzol are used in the proportion mentioned above the color will not go on evenly.

Suede and buckskin gloves may be tinted with an all alcohol solution.

Grey gloves may also be done in this manner, using a black to make the grey, and altering to the shade desired with yellow and orange. It is a good plan to keep separate solutions of brown, yellow, orange and black for toning to the different shades one meets in glove cleaning. One ounce of the dyestuff dissolved in a pint of alcohol will provide a quantity large enough for the purpose.

When finishing give the gloves a good rubbing with a velvet cloth. Suede and buckskin gloves should be given a good brushing with a stiff brush.

For dyeing kid, suede and buckskin gloves use one pint of the standard solution mentioned above in one-half of a gallon of alcohol to which has been added one-half of a pint of oleic acid. Allow the gloves to remain in this solution for a day; that is if the gloves are placed in the solution in the morning take them out before leaving the plant for the night. The gloves should be stirred every thirty minutes or so and should be kept under the solution.

When the gloves are taken from the solution they should be well squeezed with the hands and hung up to dry. When dry they should be cleaned off with benzine to which has been added a small amount of oil or vaseline, extracted and dried. The gloves may then be brushed or sprayed to any shade desired.

Grey gloves may be dyed in the same manner. Oleic acid should always be added to the bath, as mentioned above, to keep the gloves from becoming hard.

Manufacture of Phenol

A. Terrisse has found that mixed cresols fused with caustic soda and a little peroxide of lead or copper oxide, heated to 300° until too thick to stir, cooled, pulverized and the powder placed in iron tubes six feet in length and one inch in diameter, the temperature being again raised to 300° and a stream of carbon dioxide passed over the sodium oxy-benzoates that have formed, will produce phenol, which, at the temperature employed, distils off. The caustic, recovered as sodium carbonate, is re-causticized. (*Eng. pat.*, 108,938.)

Historic Logwood

Three hundred years ago when logwood was forbidden for use as a dye the dyers figured it on their books as fustic, the totals of monthly consumption of the latter showing more than came into England in a year. Suit was brought against one of the offenders and action was delayed from year to year by a stipend from members of the dyer's association paid to a prominent politician. The history of crooked practices in the dye trade long outdates the development of the coal-tar industry.—(*Jour. Roy. Soc. of Arts.*)

The Liberty Piece Dyeing & Finishing Co., 44 Morton Place, East Orange, N. J., has been incorporated to dye and finish silk. The incorporators are Walter B. Simpson, E. C. Vannaman, Jr., and Henry C. Whitehead, both of Passaic.

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MYRON DREW REESER, Managing Editor

Difficulties Overcome by American Dyestuff Manufacturers

IN discussing the difficulties which American dye manufacturers have encountered and the manner in which they have solved them, Dr. Louis J. Matos, of the National Aniline & Chemical Company, recently cited the following instances which illustrate the points in question.

The illustrations he used were widely divergent, one being hosiery and the other cloth for automobile tops, cushions, etc. Speaking of the latter, he said:

"They are usually composed of cotton and worsted threads, which means two separate tasks in one for the dyer. It is more convenient for the automobile maker to have the cloth dyed in the piece, so that he may get the exact shade he wants as the styles of the day or the fancy of the buyer may dictate. The color of the cotton must hold against nearly every imaginable vicissitude, and so must that of the worsted. And the colors must not run, because often browns and grays and other mixtures are applied to the different types of thread to provide the required effects.

"Sulphur colors are used for cotton, dyed in a special bath in which glucose plays an important part. Glucose conserves the strength in the wood fibers in the worsted while at the same time it provides that the color dyes evenly upon the cotton. Cotton is stronger when it is wet than when it is dry.

"After the cotton threads have been dyed the required shade and the fabric is thoroughly washed out, it is then cross-dyed with chrome colors on the worsted. Chrome colors are dyed in two baths, in the first of which the material to make the colors is put upon the fibre, and in the second it is developed on the spot where it is needed, by a chemical reaction. Sometimes the wool fibre is bright red after the first bath, and dark blue after the second, which is the shade wanted. It is then very fast. The whole thing must be done without affecting the particular tint of the cotton already dyed. It isn't a very difficult operation; it only requires some good head work. After the worsted has been dyed, the cloth is washed again and dried and finished. Then it goes out into the world."

Speaking of black dyes for hosiery, Dr. Matos said: "We used to wear a great deal of imported black hosiery. When imports stopped the demand grew out of bounds. Look at the census table; see how much was made, how much was imported, and then note the deficit that had to be made up. Then observe, please, that in black hosiery the dyer does not buy the dye; he makes it on the fiber, starting with aniline oil, and that for this he needs time, plenty of time, to get the color on. Then, in the finishing department, they need time and plenty of it to get the unattached color off. Please note these two points.

"Now, time was just the thing that was not allowed. Orders for black stockings and socks came in cascade fashion into the mills, for hundreds of thousands and even half millions of pairs, to meet the market. The dyers were teased and harassed and worried to hurry up at both ends of the process. Dyers are human, and it is a human quality to yield under too much pressure. So time was skimped on putting the color on, which made it come out in the wash. And it was almost skimped in the finishing, which made it crock off on your feet. These are the penalties we pay for too much hurry. And there is the whole story.

"Good hosiery and bad is made of American cotton. We spin and knit and weave here as well as they do anywhere. All the so-called good quality black lisle or cotton hosiery is dyed with

aniline, and we can challenge the world on the quality of this product. It isn't new in this country. Ellwood Hendrick made it in Albany back in 1883. The point is that dyeing is an art, and please remember also that there are great artists among the American dyers. But when, to capture a big order some man of business demands deliveries before they can properly be made, the quality is bound to suffer.

"Now I have been up to my neck in problems of this sort for a good many years and I have watched the growth and development of textile industry in this country with intense interest because my whole life is bound up in it. And one of the most comforting things has been to observe of late how one native establishment after another has resolved to stand out for quality and refuse to put its name upon anything that is not supreme in this respect. The best hosiery mills to-day will give you a negative reply if you ask for deliveries at the expense of quality.

"Another dye widely used in hosiery is sulphur black. It is used on the cheaper grades of cotton stockings and socks. It stands up well in the light, as you see by those tests, and it is a grand dye to stand washing. Curiously enough, it is also used, by processes familiar to the dyer to produce beautiful brocade effects on mixtures of cotton and silk goods. But that is another story."

Azo Colors Containing Chromium

DR. GADIENT ENGI and Dr. Carl Jagerspacher, of Basle, Switzerland, assignors to the Society of Chemical Industry, describe (Amer. Pat. 1,242,536, of Oct. 9, 1917), a new class of chromium azo dyes, yielding fast dyes on wool and other animal fibers. They are derived from ortho-oxy-azo dyes, a group of colors from which Dr. Jagerspacher and his colleagues have already elaborated several categories of interesting new dyestuffs.

In the present case the process consists essentially in treating an ortho-

aminophenol compound with a chromium compound in a hot aqueous medium, diazotizing the resultant product, combining the resulting chromium compound of an orthooxydiazobody with a naphtholic compound and treating finally the thus obtained half chromated orthooxyazo-dyestuff in a hot aqueous medium with a chromium compound.

The following example illustrates the process: 15.4 parts 4:2:1-nitroaminophenol are heated with 350 parts water, 13.6 parts crystallized sodium acetate and 11 parts chromium fluoride for 3 to 4 hours at 100° C. in a vessel provided with a reflux cooler. After the mass is completely cooled, the residue is separated by filtration and the filtered liquid saturated with common salt. The easily soluble chromium compound of 4:2:1-nitroaminophenol separates progressively as a yellow-brown precipitate. It is diazotized in the known manner and the resulting diazobody is combined with 1:8:3:6-aminonaphthol-disulfonic acid in a soda-alkaline solution. The obtained dyestuff solution is filtered hot and the half chromated dyestuff is precipitated from the filtered liquid by adding common salt. The dyestuff can, if desired, be purified by redissolution. 2.5 parts of this half chromated dyestuff are added to a solution of 2.5 parts chromium fluoride in 60 parts boiling water. The violet solution turns quickly to blue-violet and after further boiling to blue-green. After a boiling for three-quarters of an hour, 6 parts crystallized sodium acetate are added, and the liquid is separated hot by filtration and suction from the undissolved residue, evaporated to about 25 parts and the chromium compound is precipitated from it by adding 6 parts common salt. After the mass has been allowed to stand for a long time, the chromium compound is separated by filtration and suction, slightly washed and dried. It dyes wool and other animal fiber in an acid bath pure green tints, very fast to alkalis, light, washing, fulling and potting, dissolves in water to a green-blue solution, in concentrated sulfuric acid to red-blue solutions and in alcohol to green-blue solutions.

If picramic acid serve as a starting point the resultant dye is a yellowish-green. A violet dye is obtained from 2:1:4 amino-phenol-sulfonic acid.

The reaction is one susceptible of considerable variation by altering the constituents. Other soluble chromium salts can be employed, but the fluoride seems preferable.

Export of American Dyes

FIGURES are eloquent! They testify in an imposing manner to the swift growth of our domestic manufacture of artificial colors. The reports of the Bureau of Foreign and Domestic Commerce show that during the first ten months of 1917 were exported dyestuffs valued at $12,500,000. Four years ago this sum more than covered the invoice value of our imports and was four times the value of our annual domestic output. We are now meeting the bulk of our home needs for colors and shipping dyes to twenty-one foreign countries.

Prices are so inflated at present that the sum stated above may not represent in actual quantity more than we were wont to manufacture annually. The trend of production is, however, unmistakable. It speaks volumes for the energy and enterprise displayed by the American chemical industry in building up the new branch and in utilizing to the utmost the opportunity afforded by the great international convulsion.

British Color Industry

The *Journal of the Royal Society of Arts* is authority for the statement that the color supply of England is still far from satisfactory so far as quantity and variety are concerned. Exploitation has caused manufacturers for the most part to supply consumers only under restrictions against re-sale. Dyes, however, do filter into the hands of dealers. One case traced up showed color, delivered at 9s. by the maker, to have been re-sold at 36s. The first named price gave a handsome profit. Unless this condition is remedied the German combine will profit after the war.

Still

An apparatus for the distillation of light products such as benzene is described recently in *Comptes Rendus.* It is used as the official method of military aeronautics, for oils intended for aviators. The advantages of the apparatus are: (1) direct regulation of the rapidity of distillation by a stop-cock; (2) it is possible to distil each drop as it falls without usual excess heat on the residue which is the cause of decomposition; (3) each vessel of the six in line is protected from the air by its own vapors and as baths are of the same nature as the fractions obtained, so variations of atmospheric pressure are without sensible influence on the fractionation; (4) traces of water may be detected and appear in fraction 90°-110°. Volumes can be read off directly by graduated cylinders or otherwise.

The method is applicable to other volatile products, selecting baths and intervals of temperature according to the bodies to be separated. For some mixtures it is well to separate certain fractions first, then repeat parts of operations. This should be done with benzene, alcohol, etc.

Solvent Properties of Emulsions, Theory of Dyeing in a "Broken" Soap Bath

P. Sisley has made some very interesting experiments on the concentration of colloids in a foam or similarly in the emulsified portion of an immiscible solvent. Suitable colloids are azo dyes from the Safranine group. Two hundredths of a gram of dye per liter of water is a convenient strength of solution. When made acid with acetic acid and shaken with chloroform the dye collects at the layer between the liquids and on standing, as emulsion is destroyed, the dye concentrates in the aqueous layer above the chloroform

and gradually diffuses into the acid water. This property of emulsions to dissolve more than the normal amount of a colloid explains dyeing processes used. Tri- and tetra-nitro-diphenylamines do not dye silk from an aqueous suspension but from a "broken" soap bath. The use of oil emulsions in dyeing cotton and leather, as well as certain facts in physiology and therapy, can be explained by this phenomenon. (*Bull. Soc. Chim.*, 1917, 21, 155.)

Native Chinese Indigo

DISCUSSING the growth of native indigo in Fukien Province, China, a recent consular report for this district says:

Until 20 or 25 years ago the southern part of Fukien Province, in common with practically every other part of China, produced its own indigo. Then importation from abroad started, principally from Germany and Belgium, and the amount grown locally gradually diminished as the amount imported increased. The reason for this, so far as this consular district is concerned, is that the synthetic indigo from abroad was found far more efficient for dyeing purposes than the vegetable product grown locally. Chinese merchants admit that one picul (133⅓ pounds) of German artificial indigo would do the work of 20 piculs of the native product. This fact explains why the importation could have occurred, for the synthetic indigo was much more expensive, prior to the war, costing from $35 to $40 United States currency per picul. The native product fluctuates widely in quality and correspondingly in price. At present the market price is from $2 to $8 United States currency for 133 pounds.

The war, with its attendant compulsory cessation of imports from Germany, has revived the domestic culture of indigo to such a degree that now this consular district is raising enough of the vegetable product to satisfy its own needs. Customs returns for 1915 and 1916 do not mention indigo as having been imported into Amoy, though in 1913 there were 230 tons imported to a value of approximately $94,500 and in 1914, 236 tons, valued at approximately $87,000.

The three centers of production in this consular district, all of which incidentally are places where the manufacture of native cloths is of some importance, are Changchow, Chuanchow, and Tungan. Prior to 1914 these three cities all depended largely on imported synthetic indigo, but circumstances have compelled them to grow the vegetable product for their own needs, and at present they not only are doing this but there is also a small surplus for export to neighboring towns.

There is nothing difficult in the culture of vegetable indigo. The crop is generally planted early in June and requires approximately four months to mature. There is little work required other than the initial preparation of the ground and the harvesting of the grass. To make the liquid indigo the grass is placed in large casks and permitted to soak for several days. Then lime is added, the grass removed, and after soaking three or four days more the

water gradually is drained off. During this draining process the liquid must be well stirred up each day.

One unsuccessful effort has been made to import indigo into this consular district from the Philippine Islands. Though the strength of the imported indigo was admittedly greater than that of the native, the price at which it had to be sold was so much higher than that asked for the native product that the experiment proved a failure.

Local merchants say that the southern part of Fukien Province is now producing sufficient indigo for its own needs, and that even after the war is over Belgium and Germany will not find the same market for their synthetic product that existed formerly.

Development of the Dyestuff Industry in Japan

AN interesting insight into the development of the dyestuff and heavy chemical industry in Japan since the outbreak of the World War was afforded by the exhibit of the Takamine Laboratories, Incorporated, at the recent Textile Exhibition. This concern operates both in New York and Tokio and has American factories at Clifton, N. J.

According to information given out by this concern many of the factors which brought about the quick development of the dye and heavy chemical industry in the United States also operated in Japan, which has a large and important textile trade, being one of the largest purchasers of American raw cotton.

Japan before the war was a large customer of the German dyemakers, but when the yellow kingdom threw in its lot with the Allies this market was instantly closed and the Japanese chemists embarked on much the same course of study which has had such splendid results in the United States.

Regarding Japanese dyes, latest reports show a great advance in this field and many colors are being produced in large quantities, but on account of Federal ruling none of these may be imported, due to the necessity of home consumption.

Among the colors produced on a commercial scale by the Takamine Laboratories in Tokio are benzo fast red A, congo red, benzo purpurine, methanyl yellow, chrysophenine yellow, Nippon direct black, Nissen dark blue, Nissen indigo (type), synthetic indigo, Nippon direct blue, Nissen black, methylene blue, methyl violet and rhodamine B. The Nissen colors are originals, developed in their own laboratories, and are especially designed for Far Eastern requirements. They refine their crudes from by-product coke ovens and make their own sulphuric acid, oleum, hydrochloric and nitric acids, electrolytic caustic soda and chlorine; and have concentrating plants for the recovery of sulphuric acid.

While many of the products which this company is exhibiting pertain more to the chemical and pharmaceutical industries than to the textile industry, they are of interest to show what great advancement has been made in Japan.

Progress of Dyestuff Manufacture in Great Britain

SPEAKING of the development of the British dyestuff industry, the London *Chronicle* of April 23rd, says:

"The British Dyes Company, which, it will be remembered, was promoted at the instance of the Board of Trade and with the assistance of the Treasury to take the position held before the war by the Germans as the main providers of synthetic dyes for British textiles, has now been at work for over two years, and is able to report good progress.

"The works at Huddersfield are a small town, and are still expanding. In nearly everything but the food and clothing of the workpeople they are self-contained and self-sufficing—they manufacture most of the more or less worked-up essentials of the industry within their own 500 acres. Necessar-

ily they are situated in an area which was selected for its neighborhood to the raw materials—suitable water, coal and crude coal tar—and to ports at which such imported raw materials as iron pyrites and nitrate of soda can be received. By their magnitude and their situation the works promise to fulfill the high task assigned to them by the State.

"The directors, in the policy which they have pursued have gone to the heart of the German success. It was not by making dyes, but by making the "intermediates" from which dyes are made, that the Germans gradually but surely forced the whole world—America as well as Europe—to depend upon them in one phase or another of this great industry. Dyemaking itself is relatively a simple and inexpensive process once you have hit upon the "intermediate," and for 30 years the German chemists have devoted themselves patiently and painfully to "intermediates," with, in the end, enormous triumphs.

Germans Eclipsed

"We other countries all made our own dyes, but only upon German sufferance, and we should have had to take the dyes themselves from Germany in time of peace if that country had chosen to stop its export of intermediates. Now the intermediates are being made at Huddersfield, and the most elaborate and expensive plant used in the whole undertaking is employed in this essential branch, which, indeed, absorbs eight-tenths or more of the capital outlay. In the laboratories, where a hundred chemists are at work, compounds have been devised and dyes produced even beyond the ingenuity of the Germans, for it is to be borne in mind that the British Dyes Company had not to start at the very beginning, but, roughly, where Germany left off in August, 1914.

"Besides the two large laboratories there is in the works a complete installation of miniature dye-making plant which, though it is small enough to be got into one room, works with all the appearance of doing the actual thing. It is used for experiments, for trying new colors, for bringing the theorist into constant contact with the practical.

"A company which is able to manufacture its heavy chemicals like nitric acid and fuming sulphuric acid, its intermediate chemicals such as benzidine, beta-naphthol, and synthetic phenol, and its fine chemicals such as the colors of the dress materials displayed in the windows of Oxford-street, is obviously in control of a pretty complete organization. The appreciation of the dye-consuming industries is demonstrated by these two facts—the company in the last two years has been enabled to pay the maximum dividends upon its share capital that it is permitted to pay, and considerable extensions of plant are in contemplation."

Aniline Black

According to a recent invention of D. de Nagy of London, England (Amer. Pat. 1,250,289 of Dec. 18, 1917), ammonium molybdate can be used effectively in the operation of forming aniline black, replacing the catalysts hitherto in use. The most valuable of these catalysts are ammonium vanadate and salts of cerium, copper and iron. One pound of the vanadium salt serves to bring about the oxidation of 270,000 pounds of aniline salt.

The following example illustrates the process in the case of producing black or black-blue color direct on the fiber:

A bath is made up of:

	Grams
Chloraniline, *o*- or *p*-	5
Hydrochloric acid (18° Bé.)	25
Ammonium molybdate	2/100
Diphenylamine	1/2
Potassium bichromate	5
Potassium chlorate	1 8/10

dissolved in one liter of boiling water. In this bath, which is preferably at a temperature of 70° C., silk, wool, or cotton is immersed for an hour. This gives the best results, but the operation may be also conducted cold throughout, or the temperature may even be

raised to the boiling point. The only subsequent treatment of the fibers is to immerse them in dilute caustic soda lye, which gives the best deep black and black-blue shades. The fibers exhibit a much more intense shade which possesses decidedly increased fastness to the action of light.

Pastes of various colors are likewise prepared by the use of the molybdate, which can be employed directly in forming dye baths. All yield products of notable fastness to light. The following are the directions for preparing and using a red dye:

	Parts
Hydrochloric acid (18° Bé.) ...	5
Aniline oil	5
Para-nitraniline	1
Nitrobenzene	2
Ammonium molybdate	3/100

These constituents are boiled together and kept at a temperature of 200° to 230° C. until the mass is a paste. This paste is then dissolved in hot water and when cool is precipitated with caustic soda.

In use, 5 grams of the red dye may be dissolved in 1 liter of hot water at a temperature of 70 to 80° C., and the solution is made slightly acid with acetic acid. The stuff to be dyed is immersed in the bath, the temperature being maintained for about half an hour to one hour, and is then rinsed in cold water and allowed to dry.

Improvements in Dyeing Machines

THOMAS and Walter W. Sibson, of Philadelphia, in recent patents (Amer. Pats. 1,246,835 and 1,246,836, of Nov. 20, 1917) outline some interesting developments in the construction of dyeing machines. The first seeks to obviate the difficulties arising from the direct admission of steam at the bottom of a dyeing tank, causing the liquid to boil over, producing often streaks in the color on goods, and preventing uniformity of temperature throughout an operation. Essential features of the improved device are means for introducing steam into the dye liquor before it enters the tank, and a centrifugal pump, which maintains a constant circulation of the liquor in the treating bath, and in consequence a uniform temperature. The bath contains the customary rotatory cylinder with compartments for the articles to be dyed.

In the second device heat is provided by means of a closed system of steam pipes, located in a large pipe, with many openings, placed at the bottom of the dyeing machine. A pump maintains a constant circulation, drawing the liquor from the bath through the large pipe, where it is brought to the proper temperature, and returning it to the upper part of the machine.

The patents are assigned to the Philadelphia Dyeing Machinery Co.

Artificial Light Changed Into Daylight

A new lens for changing artificial light into daylight is on exhibition in the Textile Show and we give a brief description of it in the hope that mill men may be interested.

It is a specially prepared lens that fits into the bottom of any standard electric light reflector and, we are told, can be adjusted in a few minutes.

It seems to us to be very practical indeed, as it would undoubtedly mean added production, accurate matching of colors, and alone all would eliminate eye strain.

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The Fastness of Logwood Blacks

LOGWOOD blacks are of excellent fastness toward the principal agencies that are considered in the choice of a fast dyestuff. Not a little confusion and ignorance exists, however, on this score. Conflicting stories and ideas are afloat. One dyer will tell you that Logwood can be dyed fast on cotton (meaning fast to light), but that it never can be dyed fast on wool. Another will stoutly affirm that Logwood is the best and fastest black on wool that has ever appeared.

Certain manufacturers, chemists, and younger dyers, with the enormous increase during the past decade or two in the number of new dyestuffs and dyeing processes, have allowed themselves at times to be persuaded that the new products were preferable to the old standard dyes, such as the true alizarines and Logwood. The new products were claimed to be as fast or faster, at any rate saving time. Again and again these same parties have come face to face with certain special requirements of mill or trade only to find that the new dyestuffs and processes could not give satisfactory results, but that they must return to the use of the old standard dyes.

In the case of Logwood, for instance, the present season on woolens furnishes a good illustration of these statements. There is a demand for grays. This means a dyeing of raw stock, shoddy, and rags black, mixing with white, and subsequent fulling. For dyeing variously colored shoddy and rags, certain manufacturers, in order to save a little time, have tried in vain to use acid or topchrome blacks; the results have not been fast to fulling, the whites have been stained. When they tried Logwood, the results have been entirely satisfactory; the shades have been improved, the whites in fulling have been perfect. Also, other important points, the use of Logwood has added weight to the material and strength to the fiber.

Principal Fastness Requisites

The fastness requisites that principally detremine the choice of dyestuff are, and perhaps in the order of their relative weight,—

1. Fastness to light and weather.
2. Fastness to fulling.
3. Fastness to boiling in water, and to steaming.

The relative weight of the various fastnesses naturally varies with the character of the work, fastness to fulling, for example, being of more importance sometimes than fastness to light.

In recent days another criterion is frequently considered of supreme importance in the choice of a dyestuff, *viz.*, its change or non-change from the daylight shade under artificial light.

Before discussing in detail the fastnesses of Logwood blacks, it should be stated that the same general remarks made under the discussion of the problems of dyeing apply to a discussion of the fastnesses of colors. Faults in the

operation and practice of departments in the mill outside the dyehouse may cause the fastest and most carefully colored fabric or material to yield results of unsatisfactory fastness. So, too, faulty dyeing may produce on goods otherwise perfectly handled, and with the use of the fastest of dyestuffs, results that are not fast.

Light Fastness

The excellent fastness to light of properly dyed Logwood blacks is not universally appreciated. The most grievous charge made against Logwood is that Logwood blacks on wool are not fast to light. This idea is wrong, and its peculiar prevalence in certain circles requires for explanation some analysis of past dyestuff history and mill practice.

The Fallacious Acid Test

Not a little of the erroneous impression concerning the fastness of Logwood blacks to light proceeded apparently from a very ludicrous cause. It is a peculiar trick of the human mind to make unfounded general conclusions. Thus, tell a person that a certain dyestuff is fast to light, and in nine cases out of ten he will jump to the conclusion that the dyestuff in question is fast to everything, fulling, acid, alkalies, etc. *Vice versa*, if a dyestuff is very sensitive to one agent it is not fast to any. Hence the widely circulated acid test led many unthinking persons to the conclusion that Logwood blacks were not fast toward any influence.

As regards the fastness of dyed fabrics to light, the acid test, of course, teaches nothing whatsoever, and this fact is now universally recognized. Nevertheless, among the contributory causes to the wrong conclusion in regard to the fastness to light of Logwood blacks the old misconceptions from this test have played their harmful *rôle*.

That these statements are not exaggerated, the action in a certain large woolen mill some years past demonstrate. Compartive light and weather exposures were made for a long period of time—a year is stated—of all known blacks for wool, artificial and natural. The Logwood black stood the best; yet on account of the greater fastness to acids of the artificial blacks the Logwood black was rejected. Except for the fact that certain trade and commission houses had established a wholly foolish acid test, the Logwood black should and would have been used to the ultimate advantage of the mill and the consumers.

Excessive Toning for Cheapness

Another reason for the undervaluation of the fastness to light of Logwood blacks comes from a commercial source, and perhaps in part from the excellencies of Logwood. A surprisingly small amount of Hematine can be so toned up with large proportional parts of Fustic and Alizarine Red as to give a very good black of average fastness to light and at an abnormally *low cost*. Unless extra fastness to light is desired the result is eminently satisfactory, particularly to the manufacturer, who is quick to avail himself of this method of making economies. But not infrequently a rigid light test is made of the result, and in comparison with a high percentage and *high cost* artificial black. The Logwood black, costing say one cent to one and one-half cent per pound to dye, is exposed with an artificial black costing two cents to three cents per pound to dye.

The comparison is, of course, unfair, and unless the artificial black is a poor one the decision will be against the Logwood black. This, then, contributes to the general misconception; the very advantage of Logwood, its beauty of shade and the possibility of making from it an extremely low cost black, works when unfair exposure tests are made in the hands of a third party to its disadvantage. If the high cost of dyeing put into the artificial black were put into the dyeing of the Logwood black the judgment would be reversed.

Lack of Information

The progress of the dyewood industry and the deplorable lack of information in circulation concerning the improvement and diversification of dyewood

products in part explains the ignorance in certain circles concerning Logwood, and why unfast blacks are sometimes dyed by otherwise intelligent dyers. There was a time in the Logwood industry when Logwood chips or rasped wood was all that the mill men had for making their Logwood decoctions and dyeings. For many years, however, the Logwood manufacturers have supplied the coloring principle of the Logwood in the form of Hematine Pastes and Crystals. Many of the products have been carefully worked up by special processes, and results can be obtained therefrom superior in many respects to those obtained from the old chips. However, these new and improved products require specially adapted dyeing processes, and for this some otherwise intelligent dyers will not stand, but instead insist on trying to color the blacks with the new product but with their old formulæ. The results can hardly fail of being defective, and this again contributes to the strengthening of the erroneous impression.

Proper Dyeing Methods

The real truth of the matter succinctly stated is that Logwood blacks are of excellent fastness to light *when properly dyed*. Concerning the proper dyeing of Logwood blacks a few directions will be given.

Logwood is an adjective dye, *i. e.*, it requires for its fixation a mordant. Different Logwood products now on the market require different mordants for their proper development. Not only so, but for different materials and fabrics the mordant for the same Logwood product must be made the subject of intelligent study on the part of the colorist.

The chromium mordant is the most acceptable and satisfactory mordant for fixing and developing Logwood on wool. The cheaper and best source of chromium is bichromate of potash or soda, and it is usually better applied with some other chemical.

Strong acids, as sulphuric acid, should not be used with the chrome, as with such the chrome snaps on the outside of the fabric or stock and causes a tendency to unevenness of dyeing and lack of penetration. Oxalic acid, on the other hand, which is often highly recommended for use with the chrome, holds back the chrome in the bath and is relatively unsatisfactory. The best assistant with chrome is a reliable brand of tartar from a reliable house. Bluestone may be used with the chrome and tartar and assist in developing the Logwood.

A very satisfactory mordant for a standard Hematine Paste of say 4% to 60% oxidation is 3% chrome, 2% cream of tartar (3% half refined tartars) and 1% bluestone. This mordant will fix and develop 10%, 15%, 20% or 30% of Hematine Paste. Small amounts of Fustic and Alizarine Red may be used to green or jet the shade of the black, if desired, with no detriment to the fastness of the black produced; the true Logwood black, however, is made by the use of increased quantities of Logwood itself.

Fulling Fastness

The fastness of Logwood blacks to fulling is more generally known and understood than their fastness to light, but even in this respect, as has already been illustrated, certain wool manufacturers and dyers have not appreciated the superiority of Logwood. For the most satisfactory results, the Logwood must be properly dyed. The fastness to steaming and boiling in hot water are allied to the fulling fastness, and in these respects Logwood blacks, properly dyed, unless the requirements be excessive, are satisfactory.

Artificial Light

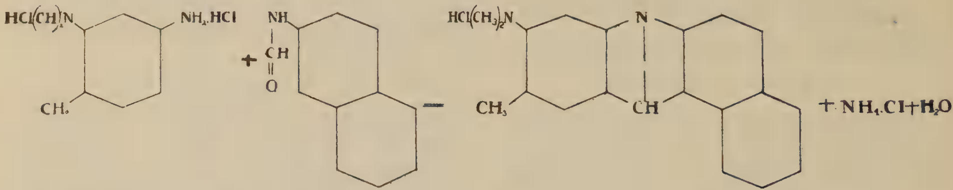
Under artificial light the handsome Logwood black does not lose in beauty, but, on the contrary, retains its rich, pure tone, and if anything, is intensified in brilliancy and richness. It is a matter of common knowledge that artificial substitutes for Logwood do not stand this test as well as Logwood. Indeed, some of he synthetic products offered against Logwood under artificial light lose their daylight tone altogether, becoming dull or brown. Much can be done by clever finishing and lustering of fabrics colored with defective artificial substitutes to overcome the fault; but it is axiomatic that the perfect dyestuff, Logwood, should be employed for the best results. With the same finishing process the Logwood dyeing would be immeasurably superior. For evening clothes and for a large variety of suitings and wearing apparel this criterion alone, other things being equal, establishes a preference for the use of Logwood.

The National Aniline & Chemical Company has leased the entire building at Broad and Wallace streets, Philadelphia, in addition to space in the Warner Building adjoining at 639-43 North Broad street, and will remove its Philadelphia plant to this location. Plans for alterations and improvements in the structure are being prepared.

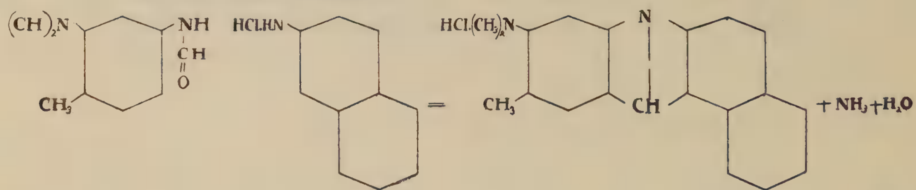
Dyes of the Benzene Naphthalene Acridine Series

H. GRUENHAGEN, of Berlin, Germany, assignor to the Aktien-Gesellschaft für Anilin-Fabrikation of Berlin (Am. Pat. 1,255,740, of Feb. 5, 1918), describes an interesting new class of benzene-naphthalene acridine colors which render good service in the dyeing of leather.

The general method of production consists in heating a formyl derivative of a b-naphthylamine with a m-diamine of the benzene series. Thus 4-amino-2-dimethyl-amino-toluene and formyl-b-naphthylamine react as follows:



These N-dialkylated benzene naphthalene acridine dyes may also be obtained in the reversed form, in heating, for example, a salt of a b-napthylamine with a formyl derivative of a 4-amino-2-dialkylaminotoluene. Thus—



The following examples serve to illustrate the manufacture, the parts being by weight:

(1). 17.1 parts of formyl-2-naphthylamine and 20.9 parts of 3-amino-dimethylaniline-hydrochloride are melted together in an enameled iron vessel, provided with an agitator and an oil bath. The temperature is gradually raised to 160°-190° C. The reaction is finished if the evolution of water vapors has ceased. The melt is then dissolved in boiling water, the solution filtered while hot and the dye precipitated from the filtrate by adding a solu-

tion of common salt and of zinc-chloride.

The new dye thus obtained forms a brown red powder. It dyes leather clear and deep orange tints.

(2). According to the indications given in Example 1 one melts together 17.1 parts of formyl-2-naphthylamine and 21 parts of 4-amino-2-methylaminotoluene-hydrochloride. The melt may be worked up as given above. The new dye thus obtained forms in the dry state and pulverized a red-brown powder, dyeing leather clear and deep orange-yellow tints.

(3). 17.1 parts of formyl-2-naphthylamine and 22.5 parts of 4-amino-2-dimethylaminotoluene-hydrochloride are melted together, raising the temperature gradually to 180° to 190° C. The new dye is separated from the melt according to the indications given above. It forms in the dry state, when pulverized, a red-brown powder, easily soluble in water. The new dye produces on leather clear and deep orange-yellow tints.

(4). 16.5 parts of formyl-meta-aminodimethylaniline and 17.9 parts of b-naphthylamine-hydrochloride are heated together, taking care to follow the general conditions given above. Hydrochloric acid may be added in working up the melt. The dye obtained is essenially the same as the product according to Example 1.

(5). 17.8 parts of 4-formylamino-2-dimethylaminotoluene and 17.9 parts of b - naphythylamine - hydrochloride are melted together at about 170°-190° C., following the general conditions above. In working up the melt it may be preferable to add some hydrochloric acid. The dye thus obtained is essentially the same as the product obtained according to Example 3.

Numerous derivatives may be used in place of the above. Instead of b-naphthylamine itself a suitable chloro- or bromo-derivative may be used. Other salts than the hydrochlorides, for instance sulfates, may be employed.

The chief importance is attached to the dye obtained in Example No. 3.

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MYRON DREW REESER, Managing Editor

Reputation of German Dyestuffs Built up by Propaganda

INVESTIGATION since the beginning of the war has revealed that the reputed superiority of German dyes was in large part due to German propaganda. The Germans spread doctrine of this sort because their dye factories were part of their equipment for war. Factories which made dyes in time of peace can be instantly converted into munitions plants in case of war. By controlling the dye industry, Germany had an unlimited supply of picric acid and other explosive chemicals when she went to war, while the other nations were without factories to make these necessary munitions.

Aided by large bonuses and bounties from the Kaiser, the Germans could sell dyes cheaper than privately-owned factories in England, America, and elsewhere could make them. When the United States Government raised the tariff on dyes to promote home industries, the German government made up the loss to its dyemakers so they could continue to sell cheaper than Americans could make the colors.

To choke the industry in America, the Germans also resorted to bribery. That was revealed, as a result of developments in China. For years other countries tried to sell dyes in China, but not until 1914 was it shown why they failed. When the war began American manufacturers bought all the available dyestuffs in the world, finding most of them in China. These were brought here in the original cans, just as they were sealed in Germany. Then it was discovered why Chinese workmen never could get good results with other dyes, but were always successful with colors bought from Germany. In every can was found a small Chinese coin. So it was shown that German monopoly was due, not to better dyes, but to unfair business methods.

American manufacturers are doing everything possible to counteract the prejudice against American dyes, created in the minds of American people, by unfair German propaganda. For instance, the famous Lancaster mills, under the management of Amory, Browne & Co. of Boston, which has the distinction of being the first mill to make brilliant plaids and stripes, has such confidence in its American-dyed goods that it is actually offering to replace with an equal yardage of the same or similar pattern, any piece of its famous "Kilburnie Zephyr," in which the colors fade or run.

Such policies should shortly establish the American dyestuffs industry in the confidence of the world.

A New Chrome Brown

A NEW, fast chrome brown has been placed on the market by E. F. Drew & Company, Inc. (The H. G. McKerrow Department). This is made by the newly-organized Knickerbocker Color Company, and is one of the most valuable and interesting chrome colors hitherto produced by American dyestuff makers.

It is of a rich, reddish brown character, requiring simply the addition of a slight toning of alizarine blue-black and the necessary admixture of white stock in order to give the regulation Government olive drab shade. It is exceedingly fast to the specified light and fulling tests, and is, therefore, an important contribution to the range of colors which are now being used for army cloths. It works either on a chrome mordant, with chrome in bath or on a top chrome method, and in addition to this gives an excellent mode shade of brown in an acid bath.

This is the first of a series of chrome colors to be made by this company, on an entirely new method, and as it can be produced in quantity at a materially reduced scale of costs, it will probably prove to be one of the most effective and least expensive colors on the market. In view of the fact that the Government is now about to place further heavy contracts for olive drab cloths and that there is a very evident shortage of both chrome brown and alizarine yellow, it would be to the interest of textile mills to bear this new color in mind in arranging for their color contracts.

We understand that E. F. Drew & Company, Inc., (The H. G. McKerrow Department) are ready to supply type samples and dyed skeins, showing the possibilities of this new color.

The Government to Take Chemical Census

It is announced from Washington that the Government, through the De-

partment of Commerce, will shortly compile a census of importations of chemical products into this country for the fiscal year ending June 30, 1914. It will be remembered that Dr. Norton, of the Department of Commerce, recently compiled a similar census of dyestuffs and that this census was widely used to assist American manufacturers of dyestuffs in determining the directions which their energies should follow. It is believed that the census of other chemicals will serve a similar purpose.

The census will be compiled by a careful examination of all importers' invoices so that it will be possible to say definitely just what quantities of what particular products were imported into this country prior to the war and to determine the country of their origin. It is expected that this chemical census will require from six months to a year to complete but when finished it should be of very considerable value to domestic chemical manufacturers.

Barrett Co. Earnings

It is reported that the earnings for the first quarter of 1918 of the Barrett Co. of New Jersey and subsidiary companies will exceed those for the same period 1917.

Large orders from the United States and foreign governments have kept the company's plant operating at full capacity. This company's report for 1917 shows net sales to customers of $34,297,370, an increase of $6,497,185; cost of goods sold, $27,173,000, a gain of $7,160,988, leaving gross profits and sales $7,124,280, a decrease of $663,-803. There was a surplus after dividends of $2,268,494, against $1,097,-283 in 1916.

The Union Chemical Company, 503 Union Building, Cleveland, Ohio, is preparing to construct a large chemical plant to be located at Lorain. The works will consist of sixteen buildings, one and two stories, and the cost will be approximately $600,000.

The United States Government has over fifty million pieces, including trousers, coats, caps and blankets to be cleaned and dyed. It is understood that the work will be given to dye establishments in different sections of the country. Inspectors of the Ordinance Department will supervise the work.

It is understood that Mayor Gillen of Newark, N. J., has issued orders to the Health Department to close the plant of the Butterworth-Judson Corporation, owing to the fumes emitted in the making of Picric Acid. We are informed that the company has just placed a contract for the erection of a stack specially prepared to absorb the fumes. The decision of the mayor follows an edict issued several weeks ago in which the company was given until May 6th to comply with the order.

The Millmor Chemical Works of Delaware has filed notice of its incorporation in Newark, N. J., where they will engage in the manufacture of chemicals and allied products.

The Struggle of Civilization Against Kultur

By E. C. Klipstein

Four Thousand Years of Conflict.

Editor's Note:—

The following article by E. C. Klipstein, president of E. C. Klipstein & Sons, and treasurer of A. Klipstein & Co., has attracted such wide attention in the pamphlet form in which it was originally issued by its author that we believe its reproduction in these pages will prove decidedly interesting to our readers. Mr. Klipstein "calls the turn" on Pan-Germanism in a most convincing manner.

THE present war had its origin in the migrations of the great Aryan family of the human race. It is the culmination of the efforts of the German division of the Teutonic branch of that family to reach the sea. We may, therefore, say with perfect certainty that the horrible conflict of to-day is only the closing trial of strength in a struggle that began four thousand years ago.

A boat is easier to build than a wheeled vehicle. It is also easier to propel, may be made to utilize the power of the winds and requires no expensive roadways. When placed in the water, it is ready for the use of man, either for social intercourse or traffic. For these reasons, men have always located their dwellings on the water. For these reasons, the Mediterranean Sea attracted to its shores communities of primitive mankind. Its facilities for intercourse and commerce by means of boats developed the small communities into cities and the cities into civilized nations.

Egypt and Phoenicia spread the fame of the Mediterranean, its commercial advantages and its delightful climate, to the ends of the earth. Hence it was that the Aryan Race, which had first sought escape from the dreary Asiatic plateau north of the Himalayas, by going directly south over the mountains to the warm and fertile plains of the Indus and Ganges Rivers, in their subsequent migrations, turned their faces westward to the Mediterranean. The Persians reached both the Mediterranean and southern ocean. The Greeks possessed themselves of the Aegean and the mainland of Greece, thereby forcing the Latin branch of the Greek family to pass to the north in order to reach Italy and found the Roman Empire. The power of Rome effectually blocked all further migrations to the Mediterranean for more than a thousand years. In consequence, the Celts made their way to the Atlantic and the Scandinavians to the North Sea, so that the German branch of the Teutonic wave was compelled to content in what we now call Germany; only, it is wrong to say it contented itself in Germany.

On the contrary, the Germans fought incessantly for ages to get out of Germany and reach the sea. They hurled themselves century after century against Rome in order to reach the Mediterranean. They pushed northward with equal vigor, driving back the Scandinavians even beyond the North Sea. At the same time, they were compelled to resist the succeeding waves of Teutonic migration; consequently, war became a natural state of existence in Germany. It was perpetual. Young men became soldiers from necessity. They acquired the habit of taking what they wanted by force. They followed war for a livelihood and did not hesitate to sell their services to the Romans, even though it involved turning their swords against their German brothers. It is no wonder that the ancient world adopted the Greek name for the inhabitants of Germany—"oi barbaroi" —"the barbarians."

After a thousand years of such conflict, the Roman power began to weaken. In the fifth century of the Christian Era, it collapsed and then the pent-

up German tribes united into groups to expend all their energies in plundering the Roman Empire. Their long military training had fitted them for the task, and this military training was continued because it became profitable. Every German community had a military chief, who every year collected the young men just reaching the arms-bearing age and led them in a summer campaign of plunder. The booty brought back in the fall was their contribution to the wealth and welfare of the community.

After plundering the Roman Empire and its colonies of the accumulated wealth of a thousand years, they took possession of the land. Within a century, we find one tribe of Germans in possession of the whole Iberian Peninsula and another holding without dispute what Cæsar called Gaul. Conquest of the land and people, however, did not make these countries German. On the contrary, the conquered peoples absorbed the conquerors to found two new kingdoms—Spain and France. By the tenth century, these new nations had become strong enough to oppose an effectual barrier against further influx, and, consequently, after that period, the Germans were just as much shut up in Germany as before the fall of Rome. After all the centuries of bloody warfare, they had failed to reach the Mediterranean. The only boats they had learned to handle were such as could navigate the peaceful waters of the Rhine, the Elbe and the Danube.

At the close of the fifteenth century, an Italian navigator, patronized by the queen of Spain and using a small Mediterranean type of boat, made the discovery of America. He proved thereby, not only the worth of a boat but, at the same time, the value of location by the sea. Immediately, the maritime nations of Europe started in to take advantage of the exploit of Columbus. Even the small powers, such as Portugal, Denmark and Holland, by virtue of their boats and seafaring experience, began to seize and colonize the New World. Germany, less favorably situated, did nothing. Within three centuries, Spain and England had possessed themselves of twenty times more of the earth's surface than Germany had been able to conquer by two thousand years of bloody conflict. Within another century, England had gained control of the world's commerce. Germany, for lack of seafaring experience, had missed her opportunity and was compelled to look on, while England and Spain developed their colonies. It might rather be said that the German States were too much occupied, contending with each other for the mastery of Germany itself, to be able to take any part in the acquisition of New World territory. This struggle went on for centuries and only ended when Prussia, having overcome Austria, precipitated and won the Franco-Prussian War.

Prussia was long regarded as the smallest and meanest of the German States. In other parts of Germany it was considered an insult to be called a Prussian. A man, dying in Baden and making his last confession of sins, is said to have been told by the priest:

"My son, it is no sin to be a Prussian, merely a disgrace."

And yet, at the battle of Sedan, Prussia not only overthrew the French, but conquered Germany and realized the age-long dream of German unity. She immediately proceeded to weld the German States into a prussianized German Empire, controlled by the principle that "Might makes right." This was a return to barbarism and brute force, and what prussianizing really meant I can best express by quoting the words of Mr. Otto H. Kahn, head of the great international banking house of Kuhn, Loeb & Co., New York. Mr. Kahn is of German descent and from his long and intimate connection with German finance, is qualified to express an authoritative opinion. In an address recently delivered, he said:

"I speak as one who has seen the spirit of the Prussian governing class at work from close by, having at its disposal and using to the full practically every agency for molding the public mind.

"I have watched it proceed, with relentless persistency and profound cunning, to instill into the nation the demoniacal obsession of power-worship and world-dominion, to modify and pervert the mentality, indeed, the very fiber and moral substance of the German people. . . .

"I have hated and loathed that spirit ever since it came within my ken many years ago; hated it all the more as I saw it ruthlessly pulling down a thing which was dear to me, the old Germany, to which I was linked by ties of blood, by fond memories and cherished sentiments. . . .

"From each of my visits to Germany for twenty-five years, I came away more appalled by the sinister transmutation Prussianism had wrought amongst the people and by the portentous menace I recognized in it for the entire world.

"It had given to Germany unparalleled prosperity, beneficent and advanced social legislation and not a few other things of value, but it had taken in payment the soul of the race. It had made a 'devil's bargain.'

"And when this war broke out in Europe, I knew that the issue had been joined between the powers of brutal might and insensate ambition on the one side and the forces of humanity and liberty on the other."

For two hundred years the German peoples had envied the English conquest of the New World, and when Prussia found herself master of the resources of all Germany, she began to covet the commerce of England. As time went on, covetousness was changed to hatred, which led gradually to the determination to wrest from England, not only her commerce, but also her control of the sea in the old German way, by brute force. "Carthage must be destroyed" said the old Roman—"England must be destroyed" became the rallying cry of Prussianism.

Hence it was that between 1871 and 1914 the Germans bent all their energies and used their resources almost to exhaustion to build both a navy and merchant marine. On every German merchant ship could be found the

Kaiser's words—"Unsere Zukunft liegt auf dem Meer"—"Our future is on the sea." At every assembly of German marines, the toast was always drunk "Der Tag," meaning "The day," when the German navy should meet and vanquish the English fleet and thus give Germany control of the sea.

To accomplish this purpose is the real object of the present war. The attack on France and Belgium was merely incidental. Prussia wanted their coal, iron and seaports to aid in the struggle with England and she seized them, regardless of treaties, simply because she had the power to take whatever she coveted. The prompt participation of England forced the disclosure of this purpose immediately, otherwise the world would have believed what Prussia intended it to believe,—that the attack on France was made solely to prevent French interference with the other part of her scheme of conquest, the seizure of a commercial highway to the Mediterranean Sea and Indian Ocean by way of Servia and the other Balkan States. England's prompt action also saved her from the inevitable future necessity of facing alone, unaided and unprepared the victorious conqueror of France and Russia.

In any case, the result of the ensuing conflict we know but too well. It is the most horrible catastrophe humanity has ever been called on to endure. Because Prussia must satisfy her avarice and lust for power, all the world is compelled to suffer. All the world must sacrifice, not only its comfort and the accumulated wealth of generations, but worst of all, the lives of its young men. Parents must grow used to the sight of their maimed and helpless sons—sightless, limbless or speechless. They must not be horrified by the awful tidings: "Your son has been drowned by a submarine or asphyxiated in the trenches." Such is the fruit of Prussian civilization, or, as it is called, "Kultur."

We judge a tree by its fruit. The world has stood aghast at the revelation of German character and methods in the present war. Both have proved to be unchanged by all the civilizing influences of the last fifteen hundred years. The army that destroyed Rheims and pillaged Belgium is in no way different from the hordes of Alaric, who sacked Rome in the fifth century.

What the world wants to know is whether "Kultur," which produces such results, represents the best civilization the German race is capable of, or whether it is only Prussianism. The civilization of a race depends on its mental capacity, and there are some indications that the Germans are intellectually inferior to any of the other Aryan races. They lack originality and imagination, as is proved by the fact that they have not contributed one single really great invention to the world's store of knowledge, and by the further fact that they have produced no great literature. They have no writer even remotely approaching Homer, Dante, Milton or Shakespeare.

Language is peculiarly the product of the human intellect and, therefore, furnishes the most exact measure of mental capacity. Beyond question, the German language is inferior to that of any of the other great Aryan families. Notwithstanding their conquest of Rome and her colonies, the Germans could never impose their language on the conquered peoples. Wherever the Romans made conquests of any permanence, they taught their subjects Latin. When the Anglo-Scandinavians took possession of the British Islands, they made their language in its modified form of modern English, the world's universal speech. But when the German language came into contact with Latin, it melted away like ice before fire. Italian, Spanish and French are simply modifications of Latin and contain almost no trace of German influence. These are some of the reasons for considering the Germans inferior to the other Aryan races.

On the other hand, we must acknowledge the evidence of great ability shown by the overthrow of the Roman Empire. We must also recognize the element of personal freedom, which the Germans infused into the civilization of modern Europe. Above all, we cannot forget that this idea of personal liberty, as expressed in the voluntary

choice of their leaders and controlled by their communal assemblies, is the foundation of the great English-speaking democracies. For these reasons, we must conclude that "Kultur" does not represent the civilization of the German people, but is peculiarly Prussian and has been imposed on the rest of Germany by military conquest; for, as we have stated before, Prussia unified Germany by subjugating the other German States and, just as every other such conqueror in the history of the Aryan races has done before, Prussia at once proceeded to make use of the united power of the German people to conquer the world.

The dream of universal conquest is the greatest fallacy of human reason. It seems to be the invariable result of the final unification of a race or nation. When Persia had mastered the Mesopotamian civilizations, she attempted the conquest of the Mediterranean. Marathon and Platæa are the eternal monuments of her failure.

A few centuries later, Macedonia subdued and unified the Grecian States, and under the extraordinary leadership of Alexander, extended her dominions over the entire Eastern World to India. This brilliant effort so exhausted the resources and energies of Greece, that within the short period of a century after Alexander's death, she succumbed to Rome and ceased to exist.

The story of Rome is the garndest in history. Nothing that military genius, the most perfect military training and the most persistent purpose could do to make the Roman Empire master of the world was neglected, and yet, Rome was first checked in the forests of Germany and then finally overthrown by the very barbarians, who are now dreaming the old Roman dream of universal domination.

The greatest military genius of all ages came, we may say, by accident into control of the French people, after they had freed themselves from the idea of the divine right of kings and had sent their nobility to the guillotine. Napoleon proved that even a democracy is not free from the lust of world domination. Democratic France, without king or nobility, continued to pursue the phantom until, utterly exhausted in resources and decimated in population, she was compelled to see Napoleon sent from Waterloo to St. Helena, there to meditate on the impossibility of conquering the world.

In spite of all these warnings of history, King Wilhelm, the last of the Hohenzollerns of Prussia, is squandering the resources of unified Germany and making a holocaust of the lives of her people in the same struggle for world supremacy. It is a trial of strength between Prussian "Kultur" and civilization. Eventually it will resolve itself into a contest between boats; between the navy of the German branch of the Aryan race, and the navies of the Latin and Anglo-Scandinavian branches as represented by Italy, Portugal, France, England and America. The result cannot be doubted. Prussianism must disappear before the broader civilization of the other Aryan races, just as the German language has disappeared when brought into conflict with Latin and Anglo-Scandinavian speech.

Mr. Klipstein has also prepared an appendix to this article which gives revelations of "The Hohenzollern Plot" by one August Thyssen, a prominent German steel manufacturer and financier, who states that at the outbreak of the war he was personally offered by the German government large grants in Birtish territory, which it was expected would be conquered, in return for his aid in financing the war.

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Germany's Stolen Chemistry

BY TOWNES R. LEIGH

EDITOR'S NOTE: *The following is a part of an article recently appearing in* DRUG AND CHEMICAL MARKETS. *It exposes the German fraud so completely and is of such genuine interest to the dyestuff trade that we take the liberty of reproducing it herewith.*

WHEN we recall that Samson slew a thousand Philistines with the jawbone of an ass, we intuitively wonder how many he would have slain if armed with the jawbone of a German propagandist, according to whom all things were made by Germans and without them was not anything made that was made. To use a medical term, the modern Teuton seems to be suffering from what is known as paranoia, or the disease of an exaggerated ego. Yet as much as the German has boasted, he has borrowed more; as much as he has talked, he has taken more.

In times of peace he has seized upon the inventions and discoveries of his neighbors for exploitation, shouting as he did so, "They are mine." When chemicals and drugs have been mentioned he has waxed especially boisterous, puffed up his breast, and roared, "They are mine." Indeed, they are not his any more than are the Belgians whom he has deported to till his field and serve his forge. The first chemical works were established by Chaptal, near Montpelier, France. It is time to prick the inflated bubble of Germany's chemical reputation.

FUNDAMENTALS OF CHEMISTRY

I have before me the leading textbook of general chemistry, the one taught in the foremost universities. Glancing down its index, my eye finally rests upon the word "Law" followed by a list containing twenty-one fundamental laws by which the science of chemistry is governed. There I see the names of Avogadro, Boyle, Charles, Dalton, Dulong and Petit, Faraday, Gay-Lussac, Henry, LeChatelier, Mendelejeff, et cetera down to van't Hoff—but nowhere do I see the name of a German. Italy, England, France, Russia and Holland flash forth in the glory of their sons wherever the principles of chemistry go; but Germany did not discover one of these secrets of general chemistry. Liebig and Wohler, who in the nineteenth century made important contributions to the branch of synthetic chemistry, received their training from the French. Germany, therefore, talks fast and furiously about the modern chemical industry and commerce with

the hope that her clamor will cause the world to forget her debts. But by the aid of Buckley's "History of Natural Sciences," we cannot forget that of the thirty chief men of science of the seventeenth century, only three were of German blood; and, of the twenty-seven of the eighteenth century, again only three were German. During the nineteenth century the science of chemistry made greater progress than it had made in all its past history. The majority of the most important contributions to chemistry during the past century were not made by Germans.

When we look over a catalog of the chemical elements we are at once impressed with the very small number of useful ones discovered and first examined by Germans. Not a component of the air he breathes was discovered by a German. Oxygen is credited to Priestley, an Englishman, who late in life settled in Pennsylvania; nitrogen, first recognized by Rutherford, a professor in Edinburgh University; carbon dioxide, isolated by Black, a Scottish chemist and physicist; helium, krypton, xenon and neon, discovered and first studied by British subjects, Lockyer, Ramsay, Crookes and Rayleigh. Not an element in water was discovered by any German. Hydrogen was discovered by Cavendish, the noted English chemist; and oxygen, its other component, by Priestley, as we have already stated. Not an element in the salt with which we savor our food was discovered by any German. Its chlorine is a gift of that productive investigator, Scheele, a Swede; its sodium, from the versatile Davy of London. The indictment which has been brought against German chemists concerning the elements in air, water, and salt may be extended to cover the elements found in seventy-five thousand other substances, including nearly all of the synthetic compounds used in the world's trade, to which we now wish to turn our attention.

Coal-tar Dye is English

There is probably no other field in which synthetic chemistry has played so important a role as in the coal-tar dye industry. A brief review of some of the salient points in its development, including the synthesis of the first coal-tar color proves conclusively that Great Britain is the original home of the coal-tar dye.

In 1739, Dr. Clayton, dean of Kildare, first distilled coal and obtained coke, tar and gas. Less than fifty years later the Earl of Dundonald, a Scottish nobleman, obtained a patent for the extraction of coal-tar in commercial quantities. In 1792 William Murdock of England, first used coal-gas as an illuminant. Naphthalene, used chiefly in the manufacture of indigo, was discovered in 1820 by Garden; benzol, the parent substance of the most important dyes, was discovered in illuminating gas in 1815 by Faraday; anthracene, largely used in the synthesis of Turkey-red was first procured by Dumas of France; toluene, used both for making dyes and the powerful explosive, T. N. T., was first obtained by Mansfield; and picric acid, also employed in the manufacture of dyes and explosives, was first prepared by Peter Woulfe, a London chemist.

In connection with these achievements, the importance of the miner's safety-lamp invented in 1815 by Sir Humphrey Davy must not be overlooked, for by the use of that simple and ingenious device, the danger and hazard of mining coal were largely removed.

The great honor of producing the first coal-tar color belongs to Sir W. H. Perkin, an English chemist, who during the Easter vacation of 1856 tried out some experiments in which he was intensely interested. He planned to produce synthetically no less a substance than the valuable alkaloid, quinine. The attempt was a failure in so far as obtaining quinine was concerned; but he noticed that a colored product had been formed. The most

interesting feature of his work was the quick perception he had of some possible value of the new substance. The dye was finally purified and given the name mauve, by which it became familiar. For fifty years it was used in printing the English penny postage stamp, by which means England maintained an unique memorial to her celebrated chemist, perpetuated even in the remotest part of the world, wherever her mail service may have penetrated.

Not long after his first great discovery, Perkin perfected a method of manufacturing alizarin, with the result that the extraction of that dye from madder has been practically abandoned; and the enormous acreage formerly devoted to the cultivation of that plant, has been given over to cereals and other crops. Thus the laboratory for the first time in history became a successful competitor with the land.

Other French and English Discoveries

After the synthesis of mauveine by Perkin the synthetic dye industry grew by leaps and bounds. Frequently methods for the preparation of the same dye were discovered independently by different chemists, and a common dye was often sold under different names. For example, Verquin, a French chemist, manufactured fuchsine and this same dye became known as magenta and rosaniline.

In 1863, an Englishman by the name of Lightfoot produced aniline black; and in 1873, the first sulphur dye was discovered by Croissant and Brittoniere of France. In connection with the development of dye-stuffs it should be recorded that to a French chemist is due the modern method of the preparation of the excellent bright yellow dye for animal fibres. Another quality which this dye possesses, is that it may be used for the detection of hemp, flax and cotton in woolen goods, inasmuch as it does not color vegetable fibres.

The American Dye Industry

Germany has exploited but did not discover coal-tar dyes. In 1913 she exported about twelve times as much synthetic color as was manufactured in the United States. Since the outbreak of the war American chemists and manufacturers have made far greater progress in the production of dyes than was ever made in Germany in the same length of time.

It may be that America is destined to control the dye industry. At the present time a very large percentage of all the known coal-tar colors are being made in America, and already there is an investment of two hundred million dollars for the production of colors and intermediates. American dyes have established their prestige in foreign markets, and in this respect the future holds an auspicious promise.

The total domestic production of aniline dyes in 1915 was valued at $2,470,000. Our exports for the fiscal year 1917, of aniline and natural dyes, were $11,710,887, an amount greater than the value of all the synthetic organic chemicals including coal-tar dyes imported annually into the United States before the war. Our total export of dyestuffs for the last calendar year amounted to upwards of fifteen millions of dollars.

It is not a strange or abnormal situation that we have been behind Germany in the manufacture of dyestuffs. In this country we have had new mines to exploit, new fields to cultivate and many industries of more immediate importance to claim the full attention of our men of enterprise and scientific training. According to Dr. Leo H. Baekeland, who has carefully investigated the subject, the chewing gum industry of the United States exceeded by several millions of dollars the value of all synthetic chemicals, dyestuffs included, imported every year into the United States. One single chain of five- and ten-cent stores in 1913 exceeded by $11,000,000 the whole of the German synthetic dye industry throughout the world. In the same year the entire German color industry paid $11,000,000 in dividends, while one American company with a single standardized product—the Ford motor car—did a greater annual business than all the German coal-tar plants together with their 1,200 different products, and earned four times their combined dividends while paying three times their wages.

As far as the mineral chemical industries are concerned, America, even before the war, could stand excellent comparison with Germany or any other country. In fact, when it comes to the production of acids and heavy chemicals we in many branches were decidedly ahead of Germany. Especially was this true of our important electrochemical industries which were developed far ahead of those of any other country.

Vat Dyes

A prominent English dyer, speaking of the relative unpopularity of vat dyes in Great Britain, in a recent interview given to the press said in part:

It might be suggested that the required shade could be got as near as possible in one dip with the vat dyes and then finished off with acid dyes in, of course, a separate bath. This sounds plausible, but rather deceptively so, we are afraid. It might possibly be successful for yarns and dressgoods that are usually dyed with acid colors, but a dyer would find two objections against it sufficient to make him unwilling to adopt it. When dyeing grey material it is possible to standardize a recipe that comes there or thereabouts first time. The first stuffing supplies a rough criterion of what the next will require. But it is more difficult to judge what to give already-colored material. The first dip in the vat would not simply mean one extra bath. If it did, there would not be so much objection. The number of subsequent baths would probably average out considerably more than by the ordinary method. Turnover would come down in consequence.

The other objection is not theoretical, but has been found in practice with indigo bottomed shades. It is that the gaslight appearance is apt to vary a great deal. If this happens with bottomings of only one dyestuff, how much more likely when two or more colors are applied from the vat. Suppose the required shade is a fawn. Now the fact that the shade is not likely to be correct first dip means, put in other words, that the shade actually resulting from the first dip may be a little red, a little blue, yellow, and so on. It will be different every time, and consequently the filling will be different each time. On one occasion some Patent Blue may be required; on another, some Orange II. Obviously, although the shades may match in daylight, they are not dyed intrinsically the same, and artificial light may test them and show them up *as* different. Unpleasantness and claims may follow. Still, by exercising judgment the bottoming and topping method ought to allow the vat colors to get an introduction. Old patterns would not have to be matched with vat dyes, but new patterns put out. Delicate shades had also better be shunned at first, so that a little total absolute alteration in gaslight would not look relatively great. A very careful record of topping dyestuffs should be kept. If possible, not more than three or four should ever be used. By adhering to this rule there would be a minimum of risk; it is worth trying.

The vat dyes will probably find fewest practical difficulties in their path in dyeing loose wool and slubbing. The dyeing of these materials in machines where the liquor circulates is the ideal

method for vat dyes. The material is under the liquor all the time, and the bath can be fairly well protected from the air. Then if one lot is off shade it could be pulled up to shade with another lot. Yet, though practical difficulties are here at a minimum, the vat dyes have still to win a place for themselves. Why?

TESTS FOR COTTON AND LINEN

A MEANS of distinguishing between cotton and linen may be clearly indicated by carrying out the following experiments: (1) Steep a sample known to contain these two fibers for two minutes in strong sulphuric acid; wash well with water, gently rub with the fingers, and finally steep in dilute ammonia; then squeeze and dry. The cotton fiber will be converted into a jelly like mass by the action of the acid, and is more or less completely removed by the rubbing and washing. The linen remains but little altered. By weighing the sample before and after the treatment an approximate idea of the amounts of cotton and linen present may be obtained. (2) Steep the sample to be tested in olive oil; then press between filter paper to remove the excess of oil. The linen fibers will become gelatinous in appearance and translucent, whereas the cotton remains unaltered. When placed on a dark background the linen fibers will appear dark and the cotton fibers light. (3) Steep the sample to be tested in an alcohol solution of rosalic acid, and then in a strong solution of caustic soda, finally rinse in water. The linen fibers will become rose-colored, while the cotton is colored much lighter and most of the color is removed by the rinsing. None of these tests is very satisfactory when the linen has been bleached, for then its cellulose may be practically identical with that of cotton. The most satisfactory way of qualitatively distinguishing linen from cotton is by a microscopic examination, as these fibers exhibit very different microscopic properties.—*Textile Mercury.*

E. C. Beetem & Son, who operate the Carlisle Carpet Mills, at Carlisle, Pa., are erecting a new dye plant which is to be out in operation about June 1 under the name of the Carlisle Dye Works. At the new plant dyeing of wool, jute and cotton goods, skein yarns, hosiery and hosiery yarns will be done, particular attention being given to the dyeing of rag stock for the rag rug and carpet trade. There will be about 10 operatives employed at this new plant, of which Peter J. Costigan is to be the superintendent. E. G. Beetem and Wilbur Fickes are the purchasers of supplies.

Notice has been filed with the Board of Public Utility Commissioners that the Rahway Chemical Manufacturing Company has changed its corporate name to the Mangano Manufacturing Company.

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A. P. HOWES, Vice-President
ELISHA HEWITT, Sec'y-Treas.

THE GRAFT QUESTION AGAIN

So many slurs have been cast upon the employees of dyestuff consumers, and in many cases without even a semblance of proof, that we feel all officials who have to do with the purchasing of dyestuffs will be interested in the following letter which has been sent out by The National Association of Purchasing Agents.

There is no doubt that the enactment by Congress of such legislation as is proposed would be most pleasing to all who practice ordinary commercial honesty and that it would serve as a restraint upon such as might wish to take advantage of the bribes offered by some unscrupulous manufacturers.

The letter is as follows:

"The Federal Trade Commission has urged Congress to enact legislation striking at the unjustifiable and vicious practices of commercial bribery. Our association, with a membership of twelve hundred purchasing agents representing important industrial interests of the country, wishes to go on record as strongly endorsing the recommendation of the Federal Trade Commission.

"We believe that purchasing agents as a class are not bribe takers. We believe that the procedure of the bribe giver in commercial fields is to approach subordinates or co-workers upon whose judgment the buyer relies, and that such subordinates or co-workers, lacking knowledge of real commercial standards, are corrupted because they have been led to believe that the so-called "commissions" represent perquisites to which they are entitled. It is common knowledge, among purchasing agents at least, the sellers of printing inks until recently paid commissions to composing room foremen; that sellers of plating supplies paid commissions in one form or another to foremen of plating departments; that sellers of marine supplies paid commissions to captains and engineers of vessels and to foremen of various yard departments, and sellers of service of various kinds to offices and office buildings paid commissions to janitors, superintendents and similar officials.

"As to how extensive the practice of commercial bribery is to-day we do not pretend to know, but we do know that industrial purchasing agents as a class abhor and actively oppose such bribery in all its forms and manifestations. We therefore earnestly and respectfully request that Congress take prompt and favorable action upon the recommendations of the Federal Trade Commission in this connection. Any measures that are passed aiming at the abolition of commercial bribery will meet with sincere and undivided approval by the purchasing agents of the country."

EXPORTS OF INDIGO

Exports of indigo from the Madras Presidency to foreign countries during the seven months from April 1 to October 31, 1917, according to figures furnished by the custom house, were: To United States, 5,488 pounds valued at $8,435; United Kingdom, 65,408 pounds, value $77,326; Straits Settlements, 21,056 pounds, value $19,093; Australia, 1,120 pounds, value $1,110; China, 8,736 pounds, value $11,320; Japan, 23,520 pounds, value $25,273; Ceylon, 28 pounds, value $9; total 125,356 pounds, valued at $142,566.—*Consular Report.*

Chemicals Used in Bleaching Dyeing and Calico Printing

(*Continued from a recent issue*)

With respect to Glue and Gelatine, the glue used should be as pale in color as possible. Gelatine is colorless glue which has been purified. An addition of glue to the dye bath ensures in certain cases the obtaining of a clearer white, particularly with the tannin discharge style. It is seldom used as an addition to thickenings but often, on the other hand, for finishing purposes, and sometimes for the dyeing of immedial colors. The solutions of glue in hot water congeal to a solid mass on cooling. When heated with acids such as nitric acid or acetic acid, it may, however, be kept in solution. Glue in aqueous solution and thin layers is rendered insoluble by the action of formaldehyde. The same is the case if fabrics treated with glue and formaldehyde are dried. Glue is most satisfactorily tested by comparative finishing or print tests.

Caseine, which is at times employed as a cheap substitute for albumen for the fixing of pigment colors, although albumen is generally preferred as it fixes these colors faster to washing, is an albuminoid obtained from milk and it is marketed as a yellowish white powder. Its aqueous solutions are not coagulated on heating, but the caseine is separated by the addition of an acid. It is also coagulated by formaldehyde. Caseine is insoluble in water but dissolves easily in the presence of alkalis. Caseine solutions are in consequence prepared with the addition of some ammonia or borax.

Ammonium Sulphocyanide. This salt forms colorless, very freely soluble leaflets. It is chiefly applied in wool dyeing in order to reduce the effect of metallic copper upon certain dyestuffs.

Calcium Sulphocyanide is employed as a colorless crystalline mass, or as an aqueous solution especially for producing other sulphocyanides. By printing woolen goods with a concentrated solution of this salt and then steaming the goods very fine crimped effects are produced.

Commercial alum is marketed either as potash alum, or as ammonia alum, which shows practically no difference in their properties. It is used in the dyeing of the Basic colors in order to retard their absorption and thus effect more even dyeings and also in the dyeing of acid colors to fix them better on the fibre.

Epsom Salts, also known as Magnesium Sulphate, or Sulphate of Magnesia, a most useful product for various purposes, is an easily soluble salt which is marketed in the form of crystals, or as a crystalline powder. It is sometimes used as an addition for sizing when magnesium chloride on account of the risk of tendering the fibre cannot be employed. It must therefore be free from magnesium chloride.

Magnesium chloride is very easily soluble, its deliquescent crystals which decompose on heating in the presence of moisture generate hydrochloric acid. It is used with much success as an addition to cotton dressings and sizings to protect the goods from becoming

mouldy and for weighting. In hot finishing on the calender magnesium chloride is likely to generate hydrochloric acid and thus affect the goods. On this account magnesium chloride is not always safe to use and is at times replaced by calcium chloride, or Epsom Salts.

Sodium Thiosulphate, Hyposulphite of Soda, or as it is sometimes called, Antichlor, is a very easily soluble crystallizing salt. Acid decomposes it, separating sulphur and sulphurous acid. It is used frequently for rendering hypochlorous acid (Chlorine), innocuous in bleached materials.

Barium Chloride is a good agent to use for weighting cotton. It is poisonous, and its colorless crystals dissolve in three times their weight of cold water and still more easily in hot water.

Calcium Chloride is a very easily soluble salt which is formed by the action of hydrochloric acid on lime and chalk, and is obtained as a waste product in many chemical processes. It is sometimes used as a substitute for magnesium chloride in finishing because it does not split off any hydrochloric acid at elevated temperatures.

Chrome Alum is obtained as a waste product in various chemical manufactures, it forms dark crystals which, notwithstanding their beautiful crystalline form, may contain a great many impurities, especially calcium sulphate, tarry, and other organic substances and free sulphuric acid. One part of chrome alum dissolves in 7 parts cold or 2 parts boiling water. Chrome alum is often used for fixing Diamine Colors and Immedial Black, in the case of the latter principally in order to obtain a more greenish shade than can be obtained with bichrome.

INQUIRY DEPARTMENT

Bleaching Khaki Clippings

American Dyestuff Reporter:

Question.—You recently published an article in the Reporter telling about the coloring matters used in the olive drab cotton goods now being made in such large quantities for the Government. The gist of the article, as we remember it, was that the use of certain dyes made the fabric unbleachable whereas if certain other dyes were used the fabric could be bleached.

We are so unfortunate as to have lost the Number containing this article and are desirous of getting another copy. If you would be kind enough to send it to us we would be greatly obliged, and will be glad to remit suitable amount.

As paper makers we are interested in this situation because such large quantities of these fabrics are now being produced that they have crowded out other and more bleachable rags from the market. The consequence of this is that bleachable rags suitable for making white papers have gone up enormously in price, and so far the paper manufacturers have not developed a practical means of bleaching the olive drab cuttings. We find, as suggested in the article, that some of the stock bleaches and some does not, and as they are mixed in the bales as they come to the paper makers it is impossible to use them.

We are in hopes that some means may be found whereby the Government can be persuaded to specify the use of such dyes on this fabric as will yield to the bleaching process of the paper maker. Otherwise the situation will become more and more acute for us, and expensive to the buyer of paper.

Yours truly,

B. D. Rising Paper Company,

Housatonic, Mass.

Answer.—We have yours of May twenty-ninth referring to an article appearing in the Reporter which discussed coloring matter used in olive drab cotton goods.

We regret that the issue of the Reporter in which this article appeared is practically exhausted. We think, however, that the following facts will answer your question:

Practically all aniline dyes, with the exception of the vat colors which are at the present time almost out of the market, can be bleached. The ordinary sulphur and direct colors which are generally used in the dyeing of khaki cloth for uniforms can be readily bleached with chloride of lime. Some khaki cloth, however, is colored by metallic oxides of iron, chromium, copper, etc.; goods so colored cannot be bleached and it is undoubtedly goods of this class which you find included among your clippings and which will not respond to your bleaching process.

By far the greater majority of khaki cloth now used by the Government is dyed either with sulphur or direct colors and we are quite in accord with you in feeling that the Government should require that such a process should be standardized.

There is, unfortunately, no method we can recommend by which you can differentiate the goods dyed with sulphur or direct colors from those which are colored with metallic oxides. The only method which we could suggest is that you bleach your clippings in the piece and then sort out by hand those which refuse to yield to the bleaching process.

AMERICAN DYESTUFF REPORTER:

Question.—Can you advise us if it is possible to obtain colors which are fast to light on Jute Yarn, or is there something in the nature of the fibre, which prevents the attainment of this result?

By fastness to light we mean the ordinary commercial interpretation of this expression, as used in connection with cotton and woollen fabrics. If it is possible to obtain fast colors on jute, kindly advise us as to the class of dyestuff, and the process required to produce such colors.

Your advice in this regard will be appreciated.

Yours truly,
COBOURG MATTING & CARPET CO., LTD.,
Cobourg, Ontario.

Answer.—In reply to your question in regard to colors which are suitable for dyeing jute fibre, we would say that the following colors are available, being all manufactured in America, and that they work quite satisfactorily on jute, giving all reasonable fastness to light: Fast Red, Azo Yellow and Metanil Yellow. Wool Green S, Acid Violet, and many other wool dyes may be dyed on jute from an alum bath and give shades of superior fastness to the direct and basic colors. A few sulphur colors are also available for this purpose, but there is little else which will work satisfactorily on jute. All of these colors, we believe, are readily obtainable in the American market.

AMERICAN DYESTUFF REPORTER:

Question.—We are much interested in extract from the speech of Dr. Pratt in your issue of May 13th. We use dyestuffs in connection with the manufacture of our product and would like very much to be certain that we are not using any German colors. For this reason, if it is possible for you to do so, we wish you would advise us of the concerns which are supposed to be selling American colors but are in reality selling German material, as outlined in Dr. Pratt's speech.

Yours truly,
WOLVERINE PAPER CO.,
Otsego, Mich.

Answer.—I think you have misinterpreted the spirit of Dr. Pratt's remarks. I do not believe that it was his intention to imply that any concerns who professed to be selling American colors are in reality selling the German product. Such a practise, if it existed, would not in any way further German propaganda and it would be tending to popularize the American rather than the German product. The instance mentioned by Dr. Pratt, when he said that a concern intrinsically German,

although changed in name, was merchandising goods under the original German label, would be exactly the opposite of what you suggest. It might be that the colors were actually of American origin although merchandised under a German name.

As far as giving you the names of concerns which we suspect of German affiliations, it would be really out of the question, as we could only do so in cases where there was uncontrovertible proof, and even then we might lay ourselves open to charges for libel. In a general way, however, we can say that it is our feeling that all those selling agencies which formerly represented German manufacturers in this country, whether they retain their original German titles or whether they have since changed their names, should be looked at askance.

In other words, we believe that an American consumer of dyes who wishes to be thoroughly patriotic and who is anxious to do his bit toward eliminating forever the German dye ring in America should patronize only those manufacturers of dyestuffs who are beyond question thoroughly and completely American, or at least non-German.

We reprint the following two letters with pardonable pride as indicating what some of our friends think of the REPORTER:

Mr. A. P. Howes,
Hewitt Publishing Corp.,
470 Fourth Ave., New York City.

My dear Mr. Howes:

I take pleasure in congratulating you upon the article on the Growth of the Dyewood Industry in America, which appeared in the special textile show number of the AMERICAN DYESTUFF REPORTER.

I was naturally most interested in the article pertaining to our own particular industry, but the general character of all the articles I thought extremely good.

Very truly yours,
DEWITT CLINTON JONES,
Treasurer, American Dyewood Co.

Hewitt Publishing Corp.,
470 Fourth Avenue,
New York City.

Attention Mr. A. P. Howes:

Gentlemen:

I have your letter of April twenty-ninth enclosing copy of the first Textile Show number of the DYESTUFF REPORTER. I wish to congratulate you upon this issue. I have never read more interesting articles, and it certainly reflects great credit upon you.

You may run the copy which you are running entitled "The Mark of a Great Industry" in your issue of May sixth. If you can give us the same position as in this issue, it will be appreciated.

If possible, I should like to have 25 or 50 extra copies of the issue containing the articles on DuPont dyestuffs.

Very truly yours,
(Signed) STANLEY F. WITHE,
Advertising Manager,
DuPont Dye Works.

To Sell Federal Dyestuff Property

Application has been made to have the property of Federal Dyestuff & Chemical sold under foreclosure, and it is expected that Judge Sandford of the U. S. District Court of Tennessee will sign the decree. Suit brought by holders of the company's two-year first mortgage notes, by reason of the default of the company to meet interest payments in December last and again in March of this year. If the decree is signed, it is expected that the property will be sold within four or five weeks. A reorganization plan is being worked out by the Krech noteholders' protective committee, and it is believed that it is planned to bid in the property.

John W. Herbert, one of the receivers appointed by the court, states that the company is now working on Government contract for 9,000,000 pounds of picric acid. In addition, orders have been received for a large amount of sulphur dyes, blues and khakis.

Price of Toluol Fixed

The price of toluol has been fixed by the Government at $1.50 per gallon in tank cars and $1.55 a gallon in drums for all quantities released for non-military purposes. The action of the War Industries Board was taken to prevent profiteering. It is requested that information be sent to the Board in all cases where a higher price is demanded.

Announcement is made by the Hellenic Color & Chemical Company that hereafter all Hellenic "Direct" Colors (which dye cotton and all materials of Vegetable origin) will be known as "Planto" (plant) colors.

All "Acid" colors (which dye wool, silk and all materials of animal origin) will be known as "Animalo" (animal) colors.

All "Basic" Colors will be known as "Primo" colors.

On May 1, the Cleveland Branch of Marden, Orth & Hastings Corp. moved into new offices in Illuminating Building. Greatly increased business necessitated a change into larger quarters. The Cleveland office is in charge of Henry W. Galley, who takes care of all the trades using colors, chemicals and industrial and edible oils in the State of Ohio and in the Pittsburgh, Pa., and Louisville, Ky., Districts.

Dr. Louis S. Munson, for eleven years associated with the Ault & Wiborg Company, of Cincinnati, as a chemist, and in recent years chief chemist, has resigned to take charge of the production department of the new dye plant being erected by the Du Pont Works on the Delaware River, near Wilmington.

The Southern Chemical & Dye Company and the Ficker Manufacturing Company, New Orleans, La., have consolidated. The capital of the combined interests is $50,000, and a $10,000 plant will be erected for the manufacture of dyes and glycerine.

American Dyestuff Reporter

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 2 New York, June 10, 1918 No. 19

Food for the Right Kind of Propaganda—The Coal-tar Products Census

THE digest of the U. S. Tariff Commission's census of coal-tar products manufactured in this country during 1917, which is published herewith, will be read with the keenest interest by all who are in the slightest degree concerned with the advancement of the industry.

The outstanding, vital fact revealed is that American manufacturers have at last the long-hoped-for independence of foreign sources of supply practically within their grasp. While it is by no means to be supposed that the crisis is wholly past, or that we are yet in a position to greet the thought of future competition with loud and derisive cackles, yet, from the standpoint of technical accomplishment the results are, perhaps, without parallel in industrial history. And certain it is that the American dyestuff industry is to-day able to stand upon its own feet and give effective battle against the threatened commercial onslaught.

At first blush the census would appear (to the general public) to indicate that the industry has "arrived." We are making, it says, as many pounds of artificial dyestuffs each year within our borders as we were wont to import each year before the war. In other words, we made nearly 46 million pounds here in 1917 where we imported nearly 46 million pounds in 1914.

Now this is the fact which will be blazoned forth in the newspaper headlines for the edification of the aforementioned and usually appreciative general public—which includes among its ranks the Patron of the Department Store. This means much to the future peace of mind of the dye manufacturer, for if the reader of these headlines is careful and genuinely interested, he may read on, and thereby learn that all is not gold that glitters. But the chances are that he has read much and often of the dye situation and has come, for reasons which will appear later, to regard all literature pertaining to it even as the now historic report of Mark Twain's death—greatly exaggerated! Therefore, there is a grand possibility that the headlines referred to will constitute the keynote and the essence of the general impression spread abroad.

The facts of the case, as further set forth in the detailed figures of the census, are that while the sum total of dyestuffs made here equals the former importations, yet in some instances the quantities of certain dyes produced here differs enormously from the quan-

tities of these same dyes previously purchased from abroad. For example, the census shows that the quantity of synthetic indigo and the important alizarin and vat dyes derived from anthracene and carbazol was less than three per cent. of the quantity of these dyes formerly imported. This decrease in the total number of pounds of dyes available was, of course, offset by a corresponding increase in the production of other and less important colors.

This phase of the truth has long been known to the trade, but it happens to be the one phase which has most persistently escaped the notice of the public at large who sought, in the face of optimistic reports from the manufacturers, an explanation of department store refusals to guarantee American colors. The seeker after knowledge was offered for consideration and reflection an apparent contradiction of facts, emanating from two distinct sources: (1) Department store clerks told him, or her, that prices were up and American dyes could not be guaranteed because there was a great shortage and the colors obtainable were inferior to the German, and (2) he read that this country was making as many pounds of dyes as it formerly imported and that American colors were as good as the German.

The real reason for the unsatisfactory conditions, which were caused by the inevitable hiatus between the time of exhaustion of stocks of imported dyes left over when all shipments ceased and the time when the American manufacturers first began sending their products in quantities to the relief of the mills, has never been forced upon his understanding in such a way as to make it stick there long enough for him to explain the situation to one of his fellow creatures. Hence, we have had a gradual weakening of confidence in public statements about the dye industry, partially buoyed up, it is true, by a patriotic willingness to believe anything good of it, but nevertheless resulting in the creation of a fertile field for German propaganda.

The dye manufacturers and the mill people know full well the makeshifts and artifices, the applications of certain dyes to fabrics for which they were never intended in the feverish desire to obtain results at any price, which followed as a matter of necessity and which must even yet, to a certain extent, obtain. It is an old story to them, but it is not an old story to the general public, despite all efforts to spread beneficent propaganda, and it is to-day furnishing the principal ground for the still alarmingly widespread belief that our manufacturers and chemists are going to prove unequal to their task.

This message must be driven home, once and for all, before it is too late, and the manufacturers and mill owners will do well to give the *modus operandi* their earnest consideration. Whether it can best be accomplished by advertising to or circularizing the department store heads, or by carefully worded statements to the press, or even by the maintenance of a Publicity Bureau charged with the task, is for them to decide. But the point is that they must get busy at once and see to it that fundamental facts, and not merely superficial conclusions, are what reach the public mind.

U. S. Tariff Commission's Coal-tar Products Census Completed

THE United States Tariff Commission announces the completion of its census of coal-tar products for 1917. This group of products includes not only the coal-tar dyes and the crude and intermediate materials required for their manufacture, but also all of the medicinal and photographic chemicals, explosives, synthetic resins, synthetic perfume materials, and flavors which are in any way derived from coal-tar products. There were produced in the United States (not inclusive of explosives and synthetic phenolic resins)

54,367,994 pounds of dyes and other finished products, which have a total value of $68,711,228. The production of the materials known as intermediates amounted to 322,650,531 pounds, with a value of $106,942,918.

The annual production was reported for the following groups of products made in whole or in part from materials derived from coal-tar: 45,977,246 pounds of dyes valued at $57,796,027; 5,092,558 pounds of color lakes valued at $2,764,064; 2,236,161 pounds of medicinal chemicals valued at $5,560,-237; 779,416 pounds of flavors valued at $1,862,456; 263,068 pounds of photographic chemicals valued at $602,281; and 19,545 pounds of perfume materials valued at $125,960.

There were 81 establishments engaged in the manufacture of coal-tar dyes in 1917 and their production during that year was practically identical with the amounts annually imported before the war. The imports for the fiscal year 1914 amounted to 45,840,866 pounds and the production in the United States in 1917 was 45,977,246 pounds. However, an analysis of this total reveals that the domestic production, though equal in quantity to the preceding imports, differs in the relative amounts of the various classes of dyes. Only a small production was reported for indigo, and the alizarin and vat dyes derived from anthracene and carbazol—classes of dyes which include some of the best and fastest colors known to the textile trade. The United States produced only 2,166,887 pounds of these dyes in 1917; and the elimination of 1,876,787 pounds of extract made from imported indigo, reduces the output of these dyes to less than three per cent. of the pre-war imports. Dyes of this class are dutiable at 30 per cent. in the Tariff Act of 1916. The lack of development in the manufacture of these particular dyes promises to be remedied to a considerable extent in 1918, for a number of firms have begun their manufacture and a large increase in production can clearly be foreseen.

In the classes of dyes which, if imported, would be dutiable at 30 per cent. plus five cents a pound, the American manufacturers have shown remarkable progress, producing 43,810,359 pounds at a total value of $57,639,990. That this represents something of an excess over the American needs is evidenced by the fact that during the fiscal year 1917, American made dyes to the value of $11,509,287 were exported to other countries. Thus the exports exceeded the pre-war imports in total value although not in tonnage nor in the variety of the dyes.

The development in the manufacture of intermediates is equally marked, for before the war almost all of these necessary materials were imported from Germany. The Tariff Commission finds that intermediates were manufactured by 117 firms in 1917 and that the production amounted to 322,650,531 pounds valued at $106,942,918. These figures, however, are somewhat misleading as there is inevitable duplication in the totals. It is well known that many of the intermediates are derived from other products of the same class. Thus, starting with benzol, the following succession of products is obtained: nitrobenzol, anilin, acetanilid, nitroacetanilid, and nitranilin. Each of these products had to be reported by the manufacturer and hence there has been some cumulative counting.

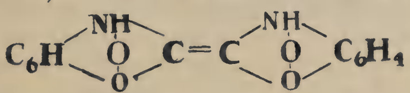
The totals for all of the coal-tar products will be published in the final report, which may well be expected to offer accurate evidence on the progress of the American dyestuff industry.

The Calco Chemical Company, Bound Brook Road, Bound Brook, N. J., is said to be considering the construction of new additions to its plant to cost in the neighborhood of $250,000 to provide for increased capacity.

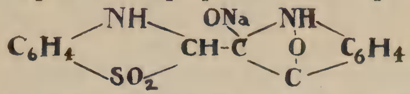
THE CHROMOPHORE OF INDIGO

M. Claasz (Ber. d. deutschen chem. Gesellschaft, September, 1916, page 2079), elaborates his theory of the structure of the indigo molecule. It is believed that the chromophore of indigo and of all its colored derivatives is the grouping CO—C═C—CO connected by a double linkage. This idea arose from the theory of Witt and although it has no analogy in other groups it has been retained. However, this theory of chromophores has been modified in this sense that not only is the presence of chromophores and auxochromes to be considered, but also their reciprocal influence and the faculty which they possess of transposing the double linkages so as to cause the color to appear. It has in fact been advanced that the color itself and its ability to color are to be attributed to a quinonic structure. The indigoids only are excepted.

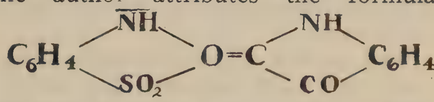
In obtaining thionyl-indigo, which corresponds absolutely to indigo, the author has shown that the chromophore CO—C═C—CO may be replaced by SO—C═C—SO, conserving at the same time the character of the product. As the grouping SO is not a chromophore, there remains only the linking —C═C—, which appears insufficient to explain the coloration. The author admits that in indigo and thionyl-indigo the groups CO or SO and NH which are in ortho positions mutually saturate each other so as to form a sort of betaine, or internal ammonium salt,



which contains orthoquinonic linking. Moreover, in thionyl-indigo the group SO being non-saturated, a relationship of double linkages may again be assumed. Therefore the author has replaced the SO by the saturated group SO_2 and has prepared the compound



which is colored but does not constitute a coloring matter. The condensation of chlor-isatin with sulfuryl-indoxyl furnishes this indigoid, which with alkalies gives a blue salt to which the author attributes the formula



and which is a coloring matter of the same character as indigo itself. It must be admitted therefore that the chromophore ofthe indigoids is formed by two quinonic benzene nuceil, united, and of which the coloration is variable—

the S is introduced, the latter becomes

tetravalent, but if S is replaced by O as in oxindigo there is no more saturation of the CO by O, that is to say the linkage is no longer transversal and the product is not colored. In fact, each time that the formation of a transverse linking is impossible the body loses its tinctorial properties; also the bodies which contain the double conjugated linkage, CO—C=C—CO, as in oxindigo (Fries and Hasselbach), carbindigo (Gabriel and Colmann), isoindigo (Wahl and Bagard) are not coloring matters.

The author therefore divides the colors in this group into two classes, *true indigoids* which contain the quinonic indogene (I) or (II) and the *pseudo indigoids,* which do not present this composition. All the true indigoids are coloring matters but those in which the two groups linked by —C=C— are quinonic, are intense colors, those in which a single one of the groups is quinonic give a lessened intensity. Finally, applying the analogy to the series of indanthrenes, the coloration of these bodies can be better explained by admitting also the betaine-like linkage.

NATIVE DYESTUFF OF SIAM

According to Consul Carl C. Hansen, the native dyestuffs which were formerly used to produce the many gorgeous colors for which the Siamese were famous are rapidly passing into disuse. He states that aniline dyes are not manufactured in Siam, and the native vegetable dyes with which the Siamese in the past produced the enduring, bright and beautiful tints on their homemade garments are now being displayed largely by imported dyestuffs. Dyeing in black, however, is still an important industry in Bangkok. Considerable quantities of silk piece goods are sent from China each year to be dyed in the juice of the green berries and leaves of the native tree "maklua" (*Diospyros mollis*). This imparts to the fabric a bright jet-black color which will stand washing. Stuffs dyed in this preparation are enhanced in value.

The heart wood of the jack tree (*Artocarpus integrifolia*) is also largely employed to produce the yellow color of the robes for the Buddhist monks. Among the natural colors which were formerly used more extensively than at present a number are mentioned. For example, a crimson red from "krang" or lac; fine deep red from "krang" or lac; fine deep red from wild "yo" (*Morinda tinctoria*); dark red and violet from "fang" or sapan wood (*Caesalpina sappan*); orange red from the sepals of "kannika" (*Pterospermum acerifolium*); scarlet from the capsules and seeds of "set" (*Rottlera tinctoria*); a beautiful pink color from the corolla of "kan foi" (*Bixa orellana*); and many others, the charming hues and shades of which formerly could be seen in the garments of the natives on festive occasions.

TARTRAZINE

Tartrazine is to the wool dyer what Chrysophenine is to the cotton dyer. That is to say, although it does not stand the severest fastness tests, its general properties are so excellent and its shade so clear and rich that it may be taken as the standard all-round acid yellow, and as such is known either under its true name or under the designations Acid Yellow A T and Hydrazine Yellow to every dyer of piece goods, of carpet and other yarns, of hats, of garments, and of silk in most forms.

The fastness to light of Tartrazine is excellent without being the absolute best, and the same may be said of its levelling property. Again, without being a milling color, its fastness to alkalis and soap is good, and its fastness to stoving, carbonizing, decatising, and rainwater excellent.

Wool, either in piece or yarn, and wool-silk pieces are dyed with an addition of 1 to 2 per cent. sulphuric acid (or 4 to 10 per cent. nitre cake) and 10 per cent. Glauber's salt. Silk is dyed in a broken soap or boiled-off liquor bath with a similar addition of acid. For viscose silk Tartrazine has no affinity, but Chardonnet silk, as also jute and chip-plait, may be dyed, and in these cases it is advisable to use a concentrated bath with an addition of alum; a temperature above 140 deg. F. is not necessary.

If a minimum of acetic or formic acid be used instead of vitriol, and the dye-bath kept throughout on the boil, the silk in silk and wool goods is left almost pure white, and may be subsequently cleared entirely.

L. B. Holliday & Co. of Huddersfield, England, as a supplement to a recent issue of the *Dyer and Calico Printer,* used a sample card showing dyeings from their Tartrazine made in various fibres. The results were most satisfactory.

CHROME COLORS NOT SUBJECT TO LICENSE

The following decision regarding the Explosives Act should be of interest to our readers:

The Directors of the Bureau of Mines, in charge of Explosives Regulation, has made the following ruling on the applicability of the Explosives Act to the manufacture, handling or use of chrome greens and chrome yellows in the dry, mixed in oil, or other vehicle:

"Amendment to the list of Ingredients of Explosives governed by the law regulating the manufacture, distribution, storage, use or possession of explosives and their ingredients (Public No. 68, 65th Congress, H. R. 3932):

"Chrome Greens and Chrome Yellows are eliminated from the listed Ingredients and will not be subject to license under this Act."

Accordingly, manufacturers, dealers, and users may handle these two substances, formerly listed as regulated ingredients of explosives, without being licensed by this Department or its agents.

F. S. Peabody,
Assistant to the Director in Charge of Explosives.

AMERICAN DYESTUFF REPORTER
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Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

DEXTER W. HEWITT, President
A. P. HOWES, Vice-President
ELISHA HEWITT, Sec'y-Treas.

UNITED STATES INVESTMENT IN DYE INDUSTRY LEADS WORLD

IN less than three years the largest dyestuff industry in the world from the point of view of money invested has been built up in the United States. In that short period of time the United States has changed from being an importer to an exporter of dyes, and is now seeking still further enlarged foreign markets for this lusty infant industry.

What this means in relation to the war is that the United States has won a gigantic economic victory over Germany. The United States has smashed with overwhelming blows the German dyestuff monopoly on this side of the Atlantic. She has wrecked Germany's most profitable market for the products of one of her pet industries. She has cut Germany off from a source of prosperity which in the past has meant the employment of thousands of men and the reaping of millions of dollars of revenue.

When the war broke out in August, 1914, there was, broadly speaking, no such thing as an American dyestuff industry. On that date there were about half a dozen factories with about 400 operatives. These factories turned out coal-tar products to the amount of some 3,300 short tons annually. This was the American dye industry of ante bellum days.

At the same time this country imported from Europe about 25,000 tons of dyestuffs each year. Of this amount Germany supplied by far the bulk, or in the neighborhood of 22,000 tons. Our annual consumption of dyestuffs was 29,000 tons. We were abjectly subservient to Germany for dyes for our wools, our cotton and our silk fabrics.

Development of Industry

To-day instead of half a dozen factories producing dyestuffs, there are well over one hundred and twenty-five, with something like fifty more in various stages of organization and erection. Unofficial estimates are to the effect that more than $200,000,000 has been invested in the American dyestuff industry; that thousands of workingmen have been trained in the brand new industry; that hundreds of chemists and chemical engineers are engaged in research work; and that throughout this new industry the leaders are organizing, consolidating, cooperating and building up the structure of a vast business which will not only render the United States permanently independent of Germany, but will go out into the open markets of the world and compete with Germany for their control.

Germany's Dyestuff Subsidies

The many ways by which the German Government lends aid to dyestuff manufacturers, enabling them to sell their products at cost or less in the United States, is explained by Alexander Alexander, in a letter to the New York *Times*, in which he says:

Suppose you need five intermediates to produce a dyestuff. Three of these may be used for explosives or for war purposes, and the Government directs you to produce five times as much of these three intermediates as you need for the dye consumption, and they pay you 300 or 400 per cent. profit on this part of the making up of that dyestuff. I do not think you need any more protection, and you certainly can undersell a competitor who has not Government subsidy, for that is what it amounts to in practice.

For instance, in the making of green crystals, toluol is required. When you nitrate toluol, you get TNT. Now if a green crystal maker produces 1,000 pounds of toluol per day, and sells 800

pounds to the Government at four times what it cost him, the 200 pounds he uses would cost him nothing and he would have some money over, which money he could use in his laboratories

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A NEW SULFUR COLOR

A NEW Sulfur Blue has recently been invented by Edward Wray of Fairfield, near Manchester, England (Amer. Pat. 1,247,475, of Nov. 20, 1917). The initial material, carbazyl-N-acetic acid, is prepared by condensing carbozole, or one of its alkaline salts, with chloro-acetic acid or its esters.

This is transferred into an indophenol as follows:

41 parts of p-nitroso-phenol are dissolved in about 410 parts of concentrated sulfuric acid to which external cooling is applied. To this solution 75 parts of carbazyl-N-acetic acid, dissolved in about 750 parts of cold concentrated sulfuric acid, are added, while stirring and cooling well. When the reaction is complete the whole is poured onto ice and the separated product of condensation is filtered off and washed with water until it is free from mineral acid.

In the dry state the indophenol is a dark blue powder which is insoluble in water, or in dilute acids, but is soluble in concentrated sulfuric acid, the solution being green, and is also soluble in dilute carbonate of soda, the solution being bluish-violet.

In the same manner corresponding indophenols (which, however, are not soluble in dilute carbonate of soda) can be produced from the esters of the carbazyl-N-acetic acid.

For the production of the dyestuff, the product of condensation may be used as it is, or it may be reduced to the leuco compound.

Sulfurization is effected as follows:

64 part of sulfur and 120 parts of crystallized sodium sulfid are melted together until the sulfur is completely dissolved; 25 parts of water are added and about 25 parts of the indophenol or of the leuco compound stirred in.

The solution is then evaporated until the boiling point of the mass has risen to 115°C. at which temperature boiling is continued for about 24 hours, with a reflux condenser. The melt is then diluted with water and purified by blowing air through the mass until the whole is oxidized. It is then filtered from the precipitated sulfur and the coloring matter thrown out from the filtrate by the addition of acid. Or the diluted melt can be completely precipitated by the addition of acid, and the leuco coloring matter be dissolved out by the addition of soda and filtered from the residue of sulfur, and precipitating by acid.

The coloring matter, and also its leuco body, are characterized by their solubility in sodium carbonate solution, from which solution they can be precipitated by means of an organic, or mineral, acid.

In the dry state the dyestuff is a bluish-black powder having a metallic luster and is insoluble in water and in dilute acids, but is soluble in concentrated sulfuric acid, the solution being a moss-green. It is precipitated from such solution on the addition of water, and is of a bright blue color. It is soluble in dilute carbonate of soda, the color of the solution being greenish blue.

The new dye resembles Hydron Blue in one respect as it can be used to dye cotton from a hydrosulfite vat as well as from a sodium sulfide bath. It can be regarded, in fact, as a derivative of Hydron Blue, which is obtained by the condensation product of carbozole and p-nitroso-phenol.

LOSS OF WEIGHT IN DYEING AND BLEACHING COTTON

LOSS of weight in dyeing is due, in the first place, to the removal of the impurities of the raw material; and, secondly, to the degumming action of the assistants added to the mordant and dye baths.

The impurities to which we refer are not the dirt and dust which should be removed if the preparation for spinning is properly carried out, but are in the fibre itself without being an integral part of it. Cotton fibre in the natural state contains 5 per cent. of waxy and resinous matters which impregnate it and, in a measure, adhere to it. These are the pectic matters which are found in most vegetable substances, and far from being of an objectionable nature they give the fibre flexibility and elasticity. They are hardly soluble in cold water; their presence prevents the cold bath from penetrating to the interior of the fibre. On the other hand, the prolonged action of boiling water softens or melts them; they either form an emulsion or are dissolved. Still, the use of hot water in wetting-out cotton takes too long a time to be practicable, and therefore alkalies are used. These easily and rapidly remove the pectic matters, and allow the water to penetrate the fibre.

It is a general rule in dyeing to wet-out the fibre completely before introduction into the dyebath, and in this way to ensure uniformity of absorption and penetration. This is especially necessary when dyestuffs or chemicals are used which are very rapidly ab-

sorbed. On the other hand, when a long process of dyeing at the boil is necessary the material may be entered into the bath without wetting-out as the gradual action of the boiling bath allows the coloring matter to penetrate sufficiently regularly, and level dyeing is obtained.

It is evident therefore that the loss of weight of the cotton fibre in dyeing may be considerable, owing to the elimination of the waxy and resinous matter, more or less complete according to the effectiveness of the preliminary boiling out. If this has been done with caustic soda under pressure in the closed kier the loss may be 5 per cent., but if the material has been wet-out with a weak solution of Turkey red oil in the open vat at a moderate heat the loss may not be more than 3 per cent.

On the other hand, the cotton gains a little weight by the absorption of the mordant or dyestuff, varying according to the depth of shade and the nature of the coloring matter. For the direct cotton colors in deep shades it is necessary to deduct 2 to 3 per cent. of the loss. Under these conditions, if the cotton has been thoroughly boiled out, the 5 per cent. loss will be brought down to 2 or 3 per cent. If it has simply been wet-out, the loss will be brought down to 1 per cent. after absorption of the coloring matter. It may be, in fact, that there is no loss at all, or, on the other hand, if a very light shade is obtained with a direct cotton color, the deduction for the amount of color absorbed may represent not more than a tenth, or less, per cent.

As regards the basic colors mordanted with tannin and fixed with tartar emetic, the mordant, reagent, and coloring matter all increase the weight, from which must be deducted the loss in boiling out. For instance, if the cotton is wet-out with Turkey red oil so that there is not more than a loss of 3 per cent., the tannin will restore 2 per cent., and the tartar emetic another one-half per cent., and, say, if Methylene Blue is the dyestuff, this will account for another 2 per cent. increase, with the consequence that there is a final gain of 1½ per cent.

With sulphur black the final gain of weight may be 2 to 4 per cent. With the mordant colors, such as logwood black, Turkey red, or the other alizarines, sometimes the increase of weight may reach 8 per cent., owing to the large quantity of mordant absorbed by the fibre.

In bleaching, the bowking, energetic washing, and treatment with chloride of lime and acids eliminate not only the waxy and resinous substances, but also a part of the mineral matters which enter into the constitution of the fibre. Thoroughly bleached cotton is therefore almost chemically pure cellulose. The matters thus removed represent a loss of about 6 per cent., from which must be deducted a slight increase, due to the addition of softeners, which may be estimated at about 1 per cent. The final loss may thus be about 5 per cent. —Translated from *L'Industrie Textile.*

DYESTUFFS FOR PERUVIAN TEXTILES

AMERICAN manufacturers of dyestuffs and anilines will find markets for their products in Peru. The anilines imported through the port of Mollendo are used in the Andean Sierras, especially in Arequipa, Juliaca, Puno, Sicuani, and Cuzco. The principal consumers of these products are the Indians, who manufacture—in their primitive looms—coarse, heavy fabrics suitable for use in their cold climate. They dye these fabrics in their homes, using vivid colors, and insisting on getting the kinds of dyes that they are accustomed to, often refusing new ones that may be better than the old. Artificial indigo competes for favor with the natural indigo of Salvador. The Peruvian importers of anilines, realizing that they could increase their business by furnishing their customers with an assortment of cheap dyes, formerly interested certain German factories, which sent their products in thin tin cans, weighing 50 or 100 grams each, making it possible for purchasers to obtain an assortment of dyes at low prices. As a result, the dye business has grown, the importation of anilines increasing each year. Before the war the German factories were most popular—practically covering the Peruvian trade in dyes. One large manufacturing house, with the purpose of avoiding competition among its Peruvian customers, prepared for each of them a label in colors representing some Indian subject, this being the only difference in the presentation and designation of the products of that factory. Moreover, it flooded the market with large posters and advertising pictures representing its chemical factories and its position as a first-class manufacturer, the result being that its goods became well known in all wholesale and retail transactions in dyes. The aniline business particularly was very large, and after the impossibility of importing German dyes, the merchants had great difficulty in renewing their stocks.

In order to be successful in this business a factory should present its products in rather small containers and as uniform as possible. The Indian purchaser is very much inclined to cling to his old customs, and to wish to get his dyestuffs put up in the form which he has found convenient. Heretofore anilines have been imported in small tin cans of rectangular shape, with a capacity of 50 or 100 grams, wrapped in paper of the same color as the dyes—that is, if the cans contain red dye, they are wrapped in red paper. On each tin can is placed a label in bright colors, lithographed, and usually representing some native Peruvian subject, such as a puma, or a llama, an Indian, etc., and the designation of the color. On the opposite side is the label "imported by so and so" (name of importer), and a statement of the net weight in grams. Seals of the producing factory also appear on both sides. In addition, the tin cans are covered with white silk transparent paper through which the trade-mark and the name of the dye are seen.

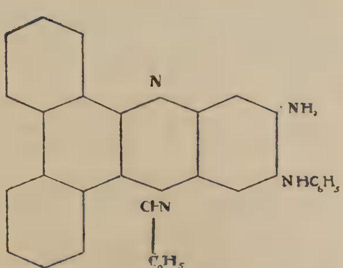
The boxes in which dyes are ex-

ported should be of light solid wood, as duty is paid on weight in the custom-houses. Therefore, the matter of packing is very important, and lightness should be attained as well as the safety of the goods. Inside the box a waterproof paper lining should be placed to protect the colors against the moisture of the sea air. Cases containing 400 tin cans of 100 grams each have a net weight of 40 kilos and a gross weight of 65 kilos; cases containing 800 tins of 50 grams each have a net weight of 40 kilos and a gross weight of 76 kilos.

The German aniline factories also provided dyes to most of the weaving and tanning factories, and this likewise amounted to a considerable business. Aniline is shipped in barrels of 50 to 100 kilos, with an inner lining of tin plate to resist the moisture of the sea voyage.—*Consular Report.*

NOTES CONCERNING THE AZINE COLORS

F. Kehrmann and Speitel have prepared phenyl-aposafranine by a new method consisting of eliminating the amino group of pseudomauveine, or monophenyl-phenosafranine, by the ordinary procedure. It is known that by the action of aniline or phenyl-aposafranine, there is formed a 2-3 dianilide derivative. The authors have found that besides this there is formed a compound which they have identified as symmetrical diphenyl-phenosafranine. The constitution of the derived anilide of amino-2-flavinduline was made the object of other researches with the collaboration of Weilenmann, Stoffel and Kehrmann have attributed to this derivative the formula—



The authors now prove the correctness of the formula, causing the synthesis of this coloring matter by condensation of phenanthrene-quinone with dianilido-4-6-metaphenylenediamine. The base in question forms leaflets with green metallic reflex, melting at 235°. Its solution in concentrated sulfuric acid is green-blue. The authors have prepared the nitrate, the chloroplatinate and the bichromate.

Kehrmann finally communicates some observations he has made on the indamines, with the collaboration of W. Poplawski. They have prepared some aromatic indamines with the object of determining if the introduction of arylenes into the amino group of these compounds sufficiently modifies their tinctorial properties from the special point of view of resistance to light and to acids so as to permit of industrial employment. This was not realized, however, but the following colors which are meanwhile sufficiently resistant to washing have been shown to be easily prepared.

Indamine of nitroso-acetamino-diphenylamine and metatoluylene-diamine,—a dark-blue crystalline powder, colors cotton mordanted with tannin an indigo-blue shade; of nitroso-diphenylamine and metatoluylene-diamine,—the same; of nitroso-ethyebruzyl-aniline sulfonic acid and metatoluylene-diamine a blue color but litle resistant to light. The condensation of nitroso-thyl-alfanapthylamine with metatoluylene-diamine gives an azine of which the chlorhydrate in soluble in water and in alcohol with fuchsine-red color and yellow orange fluorescence. Lastly the authors describe the indamine of acetamino-nitroso-diphenylamine and diamino-2:4-anisol, which colors cotton mordanted with tannin like that of the metatoluylene-diamine, and the azine of nitroso-di-

methylaniline and diamino-anisol, which fixed on cotton mordanted with tannin is the same shade as the neutral red. This azine, which crystallizes in leaflets having a feeble metallic reflex, melts at 258°, and has been prepared by making the chlorhydrate of diamino-anisol react at 60° on the chlorhydrate of nitroso-dimethylaniline in the presence of acetate of soda. After having been heated for an hour, the product is cooled in water, is acidulated with acetic acid and heated again for twelve hours while passing a current of air. The solution, which has passed from blue to red during the operation, is then precipitated with NH_3 to obtain the azine which is distinguished from the red derived from toluylene by replacement of methyl with a methoxyl group.

(Abstract, Bull. Soc. Chim., 1917, *21*, 618).

HELIO LAKE

HELIO Fast Red, discovered in 1908, was imported from Germany into the United States, prior to the war, in considerable amount, for use in calico printing. The coloring matter is now made regularly in this country and furnished to the printers of cotton cloth. The manufacture is not difficult. It results from diazotising nitro-toluidine, and developing with naphthol. It yields a scarlet of a brighter and more yellow shade than that given by Para Red. The product is not strictly a lake, because a lake is really an insoluble coloring matter produced from a soluble color by combination with its mordant. An example is the tannin lake of Methylene Blue. The helio lake is an insoluble coloring matter produced from a substance which is already insoluble. It is applied to cotton cloth by printing in the regular way with blood albumen (as a pigment).

It is also used in paints. Since it is not so easily soluble in oil as Para Red, it has the advantage of not diffusing from paints as does the latter.

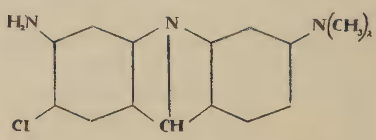
The lake quickly won for itself recognition after its introduction, on account of its remarkable fastness to light and washing, combined with a high degree of covering power and slight solubility in alcohol and oils.

NEW DYES OF THE ACRIDINE SERIES

The series of acridine dyes, so valuable in the dyeing of leather, is enlarged by the addition of certain halogen derivatives of known types, the invention of H. Grünhagen of Berlin, Germany, assignor to the Aktien Gesellschaft für Anilin fabrikation of Berlin (Am. Pat. 1,255,739, of Feb. 5, 1918).

These new dyes can be obtained by heating a halogen derivative of a formyl-m-diamine of the benzene series with a salt of an aromatic m-diamine.

The formula of the most important of the new colors is—



Its preparation is as follows:

17 parts of 1-amino-3-formylamino-6-chlorobenzene are melted together with 21 parts of 3-aminodimethylaniline hydrochloride in an enameled iron vessel, provided with an agitator and with an oil bath. The temperature is gradually raised to 180° C. and the reaction is finished when the evolution of water vapor ceases. The melt is dissolved in water, the solution filtered if necessary and the dyestuff precipitated by adding a solution of common salt and of zinc-chloride. The new dye, in the dry

state and pulverized, forms a brown-black powder. It dyes leather clear reddish-yellow tints.

Numerous variations are, naturally possible. Instead of m-aminodimethylaniline a C-alkylated derivative thereof may be used, such as 4-amino-2-dimenthylamino-1-methyl-benzene, or a halogenated derivative such as 4-amino-2-dimethylamino-1-chlorobenzene. Furthermore, bromo-derivatives may be employed instead of the chloro-derivatives.

War Trade Board Issues New Manual to Guide Shippers

The War Trade Board has issued "Rules and Regulations No. 2," superseding "Rules and Regulations No. 1," issued November 1, 1917. The publication constitutes a manual for shippers. The issue of November 1 was devoted to exports. The new edition concerns itself with official statements and rulings of all of the ten bureaus of the board.

Only such rulings appear, however, as are in effect at the date of publication, May 1, covering the control of exports, imports and trading with the enemy.

The new edition was considered necessary because much of the material in the first edition has been superseded by subsequent regulations of the War Trade Board, which were published from time to time in the *War Trade Board Journal.*

Experiments in Indigo

The annual report on Agricultural Progress in India for 1916-17, lately issued, gives some interesting details of the indigo experiments. Surprising increases in yield during manufacture have been obtained at many Behar factories by the use of *dhak* (palasa tree) gum (*Butea Wondosa*) to promote better settling. The actual increases effected have been from 3 to 6 seers per 100 maunds. It should be explained that there are 40 seers to the maund. In some factories the yield has been increased 40 to 60 per cent. by this means. The indigo suffers no appreciable loss of quality by the use of a minute proportion of a solution of the gum added to the indigo vats after beating. The gum merely promotes better settling of the finely divided indigo, and prevents loss in the large volumes of "seetwater" which have to be run off after settling. This water frequently contains one part of indigo in 10,000—that is, 0.01 per cent.—equivalent to a loss of 30 per cent. of the make. The use of *dhak* gum not only improves the yield, but greatly facilitates filtering and pressing.

Notice of authorization has been filed by the Williams Chemical Corporation of Delaware to operate a plant at Avenue E and Fifteenth Street, Bayonne, N. J., for the manufacture of dyestuffs and chemicals.

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"Circulated Everywhere Dyestuffs are Used"

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Logwood: The Historic and Standard Black

THE historic and standard black on wool is Logwood. Early recognized as without a rival for the production of fast and handsome blacks on wool, Logwood for centuries was accorded a position of pre-eminence whenever the coloring of black fabrics was considered. With the development of chemical science, Logwood was seen more clearly than ever to possess numerous peculiar excellencies for the production of blacks on fabrics. It was accordingly adopted as a standard of comparison and new products were compared with Logwood and were praised or condemned according as they equaled or fell short of the Logwood standard.

Despite unwearying attempts by armies of chemists during the recent decades, no perfect substitute for Logwood has yet been synthesized. For certain special purposes, where particular or unusual effects or fastnesses are needed, Logwood may not be applicable, and specially prepared artificial blacks may be required. Where, however, a particularly handsome and fast black is desired, Logwood, on account of its fundamental excellencies and superiorities, should be and is employed. The Logwood effects cannot be equaled with artificial substitutes.

In America particularly, nevertheless, where large production is required regardless of the properties of the resultant fabric, Logwood has for some classes of work been displaced by acid or chrome-top blacks, with the production of noticeably dead or deficient colorings. The climax of this movement came with the production of blacks neither bloomy nor full, hardly to be called blacks at all, and a range of shades that were designedly full and lifeless. From this position the trade is revolting; the coming season, say all who are familiar with trade development, will witness a revival of demand for rich heavy blues and blacks. This means logically a turning to Logwood.

The reasons why Logwood should be turned to for the production of handsome and fast blacks have since antiquity been written in the history of dyeing. However, it will be of interest to gather together certain of these facts. The reasons for the persistent pre-eminence of Logwood as *the* black on wool may be grouped under three heads: First, chemical reasons, then tinctorial, and lastly dyeing.

Chemically, Logwood is a true black. A true black is a product which has the power to color the fiber a blue shade

and then to continue coloring the fiber until a black shade develops. Thus two products of synthesis may in thin shades dye nearly identical blue tones and may at first glance seem similar blacks. The simple test of adding increasing percentages of color to the dye-baths will establish or overthrow their similarity; for then a product which is only a blue will always stay a blue, while the true black will pass from dark blue to blue black and finally to black.

Logwood, in comparison with other true wool blacks, may rightly be called in this respect a most satisfactory product,—in fact, perhaps, *the* most satisfactory of all. An astonishingly large amount of Logwood can be piled on the fiber with not only no detriment to the shade and properties of the black produced, but, on the other hand, a positive benefit. Whereas 2 to 5 per cent of a good Hematine Paste will give respectively medium and dark blues, 10 per cent will give a rich blue black; but so will 15 and 20 per cent go on and increase the solidity, beauty, and fastness of the black. With other blacks a maximum of color that may be applied is sooner or later reached, and then with successive increments of color the shades of the blacks become brown or bronzy or otherwise perverted, and the resultant dyeings crock or even dust off and are generally unsatisfactory.

Logwood Superior Black Tinctorially

The chemical superiority of Logwood as a black is doubtless accentuated by its superior tinctorial properties. The underhand solid blueness and the overhand lofty bloom of Logwood blacks on wool are proverbial. It has been the despair of the artificial color chemists to secure one synthesized product combining these peculiar desirable properties. Synthetic blacks that have been judged worth presenting to the trade have usually not been true blue blacks, but rather a succession of the most bizarre off tones: greenish toned blacks, reddish or brownish blacks, violet blacks; and in the case of top-chrome colors, violets, browns or even reds, only changeable into blacks by after-treatment in the dyeing bath with chrome. In Logwood the laboratory of nature seems to have given ready at hand a true black and a true blue black, which can be imitated but not equaled.

A true black is always preferred for the production of rich black shades. Rich colorations of any shades, be they black, blue, red, green or brown, are always made by piling on the fiber or fabric heavy percentages of the purest, brightest colors obtainable. This gives a rich, solid body and a beautiful, lofty overhand bloom. For blacks for this purpose Logwood is peculiarly adapted; its ability to dye heavily on the fiber with a beneficial intensifying of the pure blueness and rich bloom, as has been explained, in comparison with the action of off tone artificial blacks, leaves in the matter little choice.

The artificial off shade products are, however, not willingly brought on the market. On the contrary, to remedy the tinctorial defects of these straight product syntheses, the artificial color makers have resorted to the expedient of mixing or toning their products, and accordingly we have offered as "perfect" substitutes for Logwood a myriad of mixtures, which, while they are perhaps improvements in shade and properties over the straight articles, possess all the defects of mixed products. Thus well-known brands of artificial blacks are variously mixtures of a greenish and a reddish violet black with or without orange, red and yellow toning; of a greenish black with orange, red and yellow; or a dull reddish black lifted with a bright blue; or some other combinations of the colors at the disposal of the artificial black manufacturer, by mixing of which he hopes to avoid the "off shade" criticisms of his products.

But in avoiding one evil the artificial color manufacturer has run completely

into another and greater; to borrow the classical comparison, steering clear of Scylla he runs smash against Charybdis. A straight homogeneous product, other things being equal, is preferred by expert dyers to a mixed product. It is apt to work better and more uniformly. The essential straight chemical homogeneity of Logwood is fully established and a matter of common knowledge. Not a little of the perfect action of Logwood in coloring deep handsome blacks is due to this homogeneity. Mixtures containing chemically dissimilar blacks, one a greenish black, for instance, and another a purplish black, or containing a black base toned with different acting colors, red, orange, or blue, cannot be expected to work, and as a matter of fact, they do not work as uniformly and well in dyeing as a straight homogeneous black.

If Logwood contained no further valuable properties, but on the other hand many striking defects, the peculiar excellencies and superiorities that have just been considered would account for its pre-eminence as *the* black on wool, its astounding vitality against repeated assaults, and would insure its continued use by intelligent managers.

Advantages of Logwood in Dyeing

The dyeing reasons which have made Logwood a favorite are especially noteworthy. In this connection, for a fair judgment, should be considered first the dyeing requisites of a satisfactory dyestuff, and also the effect of other factors entering into the making of the goods on dyeing (and dyestuff) requirements.

The requisites of a satisfactory dyestuff, considered simply from the standpoint of its behavior in the dyeing operations, may be grouped roughly under three heads: First, uniformity of action, then leveling properties, and finally power of penetration. These properties are closely related to one another. The most uniformly acting dyestuffs are usually the best levelers. The best penetrating dyestuffs will usually color the most solid and even shades. The colors which dye slowly usually combine most perfectly these desired properties.

Faults in any of the requisites, on piece goods, will produce spots, streaks, mixed effects and clouds; and on raw stock uneven colorings that even the most capable spinning cannot overcome.

The hardest test of the value of a dyestuff in dyeing is to feed it at a boil. Quickly dyeing colors will snap on the surface of the goods unevenly, and in the majority of the cases no amount of subsequent boiling will level them. Few dyestuffs, particularly among blacks, can stand this test. Yet the necessity of feeding at a boil is, with dyers, always imminent and frequently pressing.

The effect of factors entering into the making of the goods, outside the direct control of the dyer, on dyeing opera-

tions and dyestuff requirements, is extraordinary, and, as a rule, is greatly under-estimated. The tasks of dyeing, at all times not inconsiderable, can be made much harder by those who are responsible for the goods before and after the dyeing operations, or they may, by intelligent management and capable workmanship, be greatly diminished in difficulty.

To illustrate: Defects in designing fabrics may vastly and unnecessarily increase the difficulties of dyeing. A fabric may be so designed as to be almost impossible of penetration.

The choice of stocks likewise has a tremendous influence in increasing or decreasing the difficulties of dyeing. Certain grades of wool can be well colored, if at all, only by the most versatile and resourceful master of the art of dyeing; it is frequently practically an impossibility to color evenly certain blends of different stocks. Nevertheless, again and again, after the dyer has overcome all such difficulties and is obtaining satisfactory results regularly and smoothly, an unthinking official upsets everything; without warning the dyer, he blends into the goods a different quality of stock, possibly material left over from a previous season or a "snap bargain," and the deed is done. The dyer has to work out his own salvation as best he can.

So also the preparation of the goods before the dyeing is equally fundamental and far-reaching in happy or ill-effects. The overcoming in the dyehouse of defects in the wet finishing is at times little more than a forlorn hope. Seconds are inevitable until processes in other stages of the manufacture have been perfected or standardized.

The remarks relative to the wet finishing also apply to the dry finishing. It is indeed happily true that clever and capable finishings can at times overcome defects in dyeing, but in the vast majority of cases where trouble arises the fault is the other way round, not in the dyeing, but in the finishing. Careless finishing, or an attempt to rush matters for increased production, or

some untoward, unnecessarily severe after-process, may be responsible for spoiling excellently colored goods.

The successful dyer accordingly selects his dyestuffs with a full understanding of the essential pre-requisites of a good dyestuff under favorable conditions and an eye specially open to their adaptability and characteristics under adverse circumstances. That dyestuff which possesses superior dyeing properties under ordinary conditions, and also enables him to surmount the greatest number of obstacles under extraordinary conditions, he will prefer and welcome.

Such a dyestuff is Logwood. It colors uniformly, levels excellently, and penetrates perfectly. It dyes slowly. It may be fed at the boil. Faultily designed goods and the widest variety of blends of stock are evenly colored and penetrated by Logwood. Defects in wet and dry finishing are most successfully offset by its use.

Such cannot be said in the same measure of the artificial substitutes offered against Logwood. Lack of space will not permit of going into the great mass of details necessary for a full and an exact statement of the dyeing deportments of the many artificial substitutes that have been placed on the market. Few, if any, artificial blacks, particularly among the chrome-top blacks, which are offered specially against Logwood, can be fed at the boil. The vast majority of synthetic products dye quickly, and those that do not are usually at the other end of the scale—dye with excessive slowness and require large quantities of oil of vitriol for their exhaustion; few strike the happy Logwood medium. Many artificial blacks possess certain extremely desirable characteristics, but unfortunately they also possess the defect of too quickly exhausting on the goods, or of going on only with extreme difficulty. As a result, stock and goods are not colored uniformly, the dyeings cannot be leveled up and the penetration is poor.

The top chrome or after-chrome black, the most dangerous rival of Logwood, labors further under a specific disadvantage. The great change in shade that occurs in the final chroming from purple, brown or even red to black, constitutes a source of danger and trouble.

The artificial substitutes for Logwood which are open to real criticism under favorable circumstances naturally can offer no assistance in offsetting the special troubles arising from unfavorable conditions outside the dye-house. The essential chemical homogeneity and uniformity of Logwood and its true blueness as a black, combined with the peculiar superior dyeing properties that have just been discussed, explain its preference by thoughtful and capable dyers.

Classification of Dyes From Indigo

In a decision by the Board of United States General Appraisers the collector's assessment of duty on certain coal tar colors imported by A. Klipstein & Co. is affirmed. In this ruling Judge Brown writes as follows:

"The issue involved in this case is whether coal tar color dyes are free of duty under paragraph 514, Act of 1913, as 'dyes obtained from indigo,' as claimed in the protests, or whether said dyes were properly classified under paragraph 20, Act of 1913, providing for coal tar colors or dyes at 30 per cent. ad valorem.

"At the trial the claim was limited to merchandise described at Ciba Brown R. Paste.

"On behalf of the importers, testimony was taken by the deposition of the chemist and director of the manufacturing company in Basle, Switzerland. The witness, by his answers to interrogatories and cross-interrogatories, showed that the merchandise, the classification of which is in dispute, was manufactured from an indigoid, that is, from a substance containing the color group of indigo known as Diamidoindigo. This substance is then brominated, the bromine replacing certain atoms.

"In the case of the United States vs. Hensel, Bruckmann & Lorbacker (7 C. A. R. 391; 32 Treas., Dec. 89), the court held that the provision for 'dyes obtained from indigo' covered only dyes manufactured from indigo itself and did not include similar dyes, or dyes precisely alike, in the manufacture of which the complete indigo formula did not exactly appear.

"Upon the frank admission of the witness that this merchandise was not made directly from commercial indigo, and that in the manufacture the technical formula of indigo itself did not appear, we hold that it was properly excluded from free entry.

"The protests are therefore overruled."

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DEXTER W. HEWITT, President
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ELISHA HEWITT, Sec'y-Treas.

British Dyes After the War

IN the last four years the United States and England have created and built up dyestuffs industries which satisfy the needs of textile and other manufacturers who formerly relied upon imports from Germany. In this country we are not only making enough for ourselves, but are exporting a large surplus. Undoubtedly, in some way the new industry here will be preserved after the war and defended against Germany's attempts to regain her old market. About $200,000,000 has been invested in it, and if chemicals and drugs be added the total is $380,000,000.

What are England's plans for defending her dyestuffs industry when, after the coming of peace, Germany shall strive to restore her old export trade? The Balfour Committee on Commercial and Industrial Policy After the War has recommended that the importation of goods of enemy origin shall be prohibited, subject to license in exceptional cases, for at least one year. With respect to dyestuffs, however, there is some departure from the general policy. Sir Albert Stanley, President of the Board of Trade, recently said in the House of Commons that the British Government approves control of dyestuff imports by licenses for at least ten years. It is proposed that authority to grant or to withhold licenses shall be given to a commission composed of dye-makers and dye-users, an equal number of each class, with an independent chairman appointed by the Board of Trade. This commission is to have a free hand, and its decisions will be final.

If this plan be made effective, it can be foreseen that Great Britain's imports of German dyes for ten years after the war will be a negligible quantity. We are now sending aniline dyes to England, and these exports will not be checked, so long as the colors are needed there. There will be licenses for the American product. While it may not be expected that we shall use similar methods for defense, this license system deserves some consideration here. We have tariff duties and laws against the "dumping" of foreign goods in our market at prices below cost of manufacture and ocean transportation. The Tariff Commission is deeply interested in our new dye industry, whose growth it has promoted, and the Federal Trade Commission will oppose competition from abroad that is unjust to our manufacturers.

Bluestone

In view of the increased demand for bluestone, that has followed the revived use of natural dyestuffs, every dyer and buyer should know something of the properties and sources of supply of this chemical.

Crystalline cupric sulphate, as bluestone or blue vitriol is scientifically termed, when one hundred per cent pure contains 25.46 per cent of copper and 36.07 per cent of water of crystallization. When a crystal is heated above 212 degrees F. it at once commences to lose its blue color and its surface becomes covered with a white powder. When the crystal is produced from an acid solution, this loss of water of crystallization will take place in a short while on exposure to sunlight and a drying atmosphere at weather temperatures, but when its generation is from a neutral liquid, the crystal exhibits much greater resistance to decomposition. The white appearance of dehydrated crystals in a lot of commercial bluestone is therefore, not, as some consumers believe, an indication of inferior quality.

Bluestone dissolves in about three

parts by weight of cold water and in about one-half part of boiling water. Inasmuch as small crystals can be made to dissolve at a much greater rate than large and because no appreciable difference in the copper content of large and small sized crystals should exist in the product of a reliable manufacturer, it is of advantage, whenever speed in the operation of dissolving is a consideration to use the finer brands of bluestone. The small crystals, however, from some sources carry considerable quantities of water, insoluble substances such as basic sulphates or arsenites of copper, iron or zinc, sulphates of lead or lime, ferric oxide, oxide of antimony, clayey, silicious or organic matter. Even silver and gold to the extent of a nominal value of several cents per ton of bluestone is frequently found in this residue.

The common impurities of bluestone, depending upon its source, are iron, nickel and zinc. The last is found in the product derived from pickling liquors from brass mills, or from the wet process method of reclamation of brass waste. By process of leaching roasted copper-bearing ore, or a copper blast furnace product called matte with sulphuric acid and repeated crystallization, bluestone of varying purity is obtained from the resultant liquor. The most refined product of such processes rarely contains more than ninety-eight per cent of cupric sulphate and carries usually a large percentage of insoluble matter.—*Textile World Journal.*

New Drug Companies

The total capitalization of new companies formed for the purpose of manufacturing drugs, chemicals and dyestuffs in the month of May fell far below the records of the preceding months of this year. Only $1,200,000 in new money entered the drug business in May, as compared with $3,980,000 in April, $13,635,000 in March, $21,250,000 in February, and $11,125,000 in January. The aggregate for the entire war period now stands $378,987,000.

The School of Dyeing

By A. F. Musgrave

Editor's Note:—*The following is a more or less elementary treatise explaining the nature and methods of use of several well known colors. While designed to instruct the garment dyer and appearing originally in the "National Dyer and Cleaner," we feel that much of the article should be of interest to readers of the* Reporter.

Alizarine and True Mordant Colors

A brief survey will be made of these colors and the methods by which they are applied. It is very seldom that a garment dyer needs to use a dyestuff belonging to this class, but it is interesting to know in what ways they differ from the foregoing dyes.

Alizarine, the oldest member of the group, has been known for a long time as it is the active coloring principle in the madder root which was used by the ancients. At the present day the artificial alizarine has driven the natural product from the market owing to the fact that clearer shades can be produced, and that the various shipments are better standardized as to strength. Alizarine does not produce a satisfactory color by itself, and for this reason it must be applied to the fiber in conjunction with some other product which will form a colored insoluble body. The product, which is combined with the alizarine to form this insoluble body, must have certain properties in itself; or, in other words, it must react with the wool fiber and be made insoluble thereby. In brief, the process consists in treating the wool fiber with a metallic salt which breaks up and deposits on the wool fiber a body which, in the dyeing process proper, has a strong affinity for the coloring matter.

For the mordanting process, therefore, it is necessary to use a chemical compound which is broken up by the basic nature of the wool fiber, and certain chromium salts, particularly potassium bi-chlorate, are very suitable for this work. If wool fiber is boiled in a solution of potassium bichromate, which is called chrome in the dyehouse and will be called by this shorter name in this article, the chrome is broken up and an insoluble oxide of chrome is deposited on and within the fiber. This insoluble oxide has a strong attraction for certain dyestuffs, combining with them to form colored bodies of great fastness.

When the mordanting is carried out by boiling the wool fiber in a simple bath of chrome, the chromium oxide, which is precipitated onto the fibers, is not in the proper form to produce the best colors. The reason for this is that in this case the deposited oxide has acid properties which tend to destroy some of the color during the subsequent dyeing. For this reason it is usual to add certain other chemicals to the mordanting bath in order to reduce the oxide to its basic state. Any reducing agent is suitable for this work, the principal ones in practical use being cream of tartar, lactic acid, lignorosine, etc. This cream of tartar is not to be confused with the tartar emetic which is used for the mordanting of cotton when dyeing with basic dyes. In fact the processes of mordanting cotton and wool are entirely different inasmuch as there is no chemical action between the cotton fiber and the mordant.

The following receipts show how the mordanting is carried out in practice:

	Light Shades per cent	Medium Shades per cent	Dark Shades per cent
1—Chrome	2	3	4*
Tartar	2	2½	3†
2—Chrome	1	1¼	2
Lignorosine	2	3	4†
Acetic acid	2	3	3†
3—Chrome	1½	2¼	3
Lactic acid	2½	3¾	5†
Acetic acid	2	2½	3†

* Mordanting Agent.

† Mordanting Assistant.

The properly cleaned wool is boiled for from ninety minutes to two hours in the above baths. It is then rinsed

after which it is ready for dyeing. The mordanted material should not be allowed to lie about for any great length of time before the dyeing process is started as the light affects the mordant. In this case uneven dyeing is very liable to result.

The alizarine colors may also be applied to cotton, although it is necessary to mordant the fiber. The principal use of alizarine colors on cotton is for the production of Turkey red by dyeing alizarine over an oil mordant. This process is rather complicated and of no commercial value to the garment dyer so that it will not be discussed at this time.

It is well known by garment dyers that badly faded goods are dyed more evenly by first treating in a boiling bath of chrome, and in reality this is a simple mordanting.

Sulphur Colors

The sulphur dyes, although not of great interest to the dyer of garments, may be described briefly as they are, as a class, very fast and very interesting. The sulphur dyes have not been well investigated and not much is known regarding their constitution. In many respects they resemble the direct dyes in that the cotton fiber shows a strong attraction for them. It is not necessary, therefore, to make use of mordants for their application. In one very important particular they are different from direct dyes. This is that they are not soluble in water. This accounts for the fact that these dyes are very fast to washing. The range of colors in the sulphur group is not as good as that of the direct class, there being very few good bright shades. The class comprises yellows, dull oranges, browns, greens, blues, dull violets, dull maroons and blacks.

A few of the sulphur dyes have very good fastness to light, but as a class it is impossible to say that their light fastness is very good. The wash fastness of all is considerably better than that of the direct group, while the fastness to acids and alkalies is also good. The sulphur dyes have one bad fault. This is that when the material is first taken from the dye bath the shade will keep changing for some time. This change is due to the oxidation of the color by the air. For this reason it is usually the practice to give the dyed goods a treatment which will bring about this oxidation rapidly and thus show the dyer just where he stands. Among the oxidizing agents used for this purpose may be mentioned chrome, bluestone, peroxide, perborate, bisulphite and magnesium sulphate. Of course all of the sulphur dyes do not change to the same degree. The writer has in mind two sulphur browns, the first of which when first taken from the dye bath is a green-

ish brown, and in time develops to a bright reddish orange. The second becomes slightly redder. The writer has also wondered whether or not there is any relation between the degree of oxidation change and the fastness of the resulting color. Of the two dyes mentioned above the one which changes to the greater degree is much less fast to light than the other, but an isolated case like this does not necessarily mean that the rule holds true for all colors. It is well known that in the after-chrome class of colors, those dyes that are changed most by the chrome give the fastest shades.

In order to dye the sulphur dyes it is necessary to make use of a dyeing assistant which is not used on any other group of dyes. This dyeing assistant is sodium sulphide, which is prepared by heating sulphur and caustic soda together. Sodium sulphide comes on the market in two forms. As crystals containing a large amount of water, and as chips or blocks containing no water. The latter form is called sodium sulphide concentrated, and has twice the strength of the crystals. The function of the sodium sulphide is to reduce the sulphur dye to a soluble state. Soda ash is also used in the dyeing of this group of dyes, its function being two-fold: First, to soften the water and, secondly, to react with any hydrogen sulphide that is liberated and combine with it to form sodium sulphide. Other assistants are the well-known common and Glauber's salts which are used for the same purpose as when dyeing the direct dyes.

Not all of the sulphur dyes require the same amount of sulphide in order to dissolve them, the amount being dependent, of course, on the concentration and purity of the color. Owing to the fact that the sulphur dyes do not exhaust very well, it is usual to keep standing baths for black and for dark shades. It is, of course, a very difficult matter to keep standing baths of tans, etc., where the shade is produced with three separate dyes, owing to the fact that the different dyes do not always exhaust in the same ratio. The sodium sulphide, which is used for the dyeing of sulphur dyes, does not in itself have any harmful action on the cotton fiber; but if it is not thoroughly washed out of the goods after the dyeing it may eventually become oxidized to sulphuric acid and then produce tendering. For this reason it is necessary to give the dyed material several rinses.

The majority of the sulphur dyeing is done at the boil, and the goods should be kept under the liquor as much as possible in order to prevent the formation of streaks due to the oxidizing action of the air. Certain of the sulphur blues are best dyed at about 160 degrees F., these being the blues which reduce to a yellow in the dyebath. A typical receipt for dyeing with sulphur dyes is as follows: Make up a dyebath composed of ten per cent of soda ash. These are boiled together to dissolve the color and from thirty to fifty per cent of salt is then added to the dyebath.

The dyeing is carried out at the boil for one hour. The material is then squeezed and rinsed, except for certain blues which must be oxidized before

they are rinsed. The after-treating, when desired, is done after the material has been rinsed. The simplest and best after-treatment for quick oxidization being carried out with one per cent of perborate of soda, at a temperature of one hundred degrees F., for fifteen minutes. In addition to bringing out a rapid oxidization, the use of chrome and bluestone in the after-treatment also considerably increases the fastness to light and washing.

An important fact not mentioned before is that the dyeing of these colors must be carried out in iron or wooden kettles, no brass or bronze fittings, or copper, being permissible.

Vat Dyes

The vat dyes are the latest group of dyes to be placed on the market, and they are widely used on account of the fast and brilliant shades which they produce. The vat dyes as a class resemble indigo in that they are applied in the same manner. While they are not of interest to the garment dyer in the commercial sense, a brief survey of the methods of applying them will no doubt be of interest.

The vat dyes are sold as pastes or powders which are insoluble in water, and in order to bring them into a state of solution so that the cotton fiber can take them up, it is first necessary to change them to a soluble form. This is accomplished by reducing them with sodium hydrosulphite and alkalies. Take, for instance, a certain well-known blue which the dyer wishes to dye. He would take from ten to twenty per cent of dye paste and mix with it about twice its volume of warm water. He would then add, figuring on the weight of the dyestuff taken, twenty-five per cent of caustic soda, forty per cent of soda ash, ten per cent of soluble oil and thirty per cent of hydrosulphite. He would then keep the above mixture at 140 degrees for about thirty minutes. The color of this solution would then be a golden yellow. The dye tub is then filled with water at 140 degrees F. and one pound of hydrosulphite added for each three hundred gallons of water. The dissolved color is then added. The dyebath is now yellow with a blue scum on top. The goods are then added and turned well, keeping them under the liquor as much as possible, for about fifteen minutes. They are then taken out and squeezed quickly and then allowed to hang in the air for thirty minutes. When first taken from the dyebath the goods are a yellow color but rapidly become blue. At the end of thirty minutes the goods are given another dip for the same length of time, squeezed and oxidized as before. The goods are then given a soaping at the boil, which in some cases makes a considerably different and deeper shade. The dyeing is then finished and the dyebath is kept for future lots.

The above sounds simple but it is a

fact that the vat dyes are the most difficult of all dyes to apply satisfactorily. It is, of course, a rule of dyeing that the faster the dyeings to be produced the more skill there is required on the part of the dyer.

While all vat dyes are not applied with just these amounts of chemicals, the principle is the same. Those dyes which change least in color when in a reduced state, or, in other words, those which show the least oxidation change are the easiest to dye level. At the present time the bulk of these dyes are used for stripes for shirtings—for which they are well adapted owing to their fastness to chlorine—for embroidery silk, etc.

Ingrain or Ice Colors

This is another class of colors which are not used by the garment dyer, but which, for the sake of completeness, will be briefly described.

Among them may be mentioned Para Red, Alpha-naphthalamine Claret, Dianisidine Blue. Other colors which are produced on the fiber but which are not properly ice colors are Aniline Black, Fast Printing Green, Fur Blacks, etc. Still certain other colors which may be described briefly are the so-called mineral colors such as Chrome Yellow, Iron Buff, etc.

Para Red—This color is produced on cotton goods by first preparing the cloth with a solution of Beta Naphthol and then passing through a solution of diazotized para nitraniline. Great exactness and care is necessary in producing this color in order to secure good results.

Alpha-naphthalamine Claret — This color is produced on cotton cloth by impregnating the fiber with Beta Naphthol and then passing through a solution of alpha-naphthalamine.

Dianisidine Blue—This color is prepared from a bottom Beta-Naphthol, passed through diazotized dianisidine and then after-treated with copper salts.

Aniline Black

Without doubt Aniline Black is one of the fastest blacks that can be produced on the cotton fiber. Aniline Black in itself is not a true dyestuff, as it can be produced on the fiber only in an insoluble condition. For dyeing Aniline Black the goods are treated with a solution of aniline hydrochloride and this is then oxidized to form Aniline Black. Aniline Black is used largely in cotton printing. It is not used on wool or silk owing to the difficulty of applying it to these fibers.

There is also a so-called, one-bath Aniline Black which is sometimes used

over a bottom of sulphur blacks. In this process the aniline hydrochloride, acid and oxidizing agent are all put into the same bath, and the color is thus produced partly in the bath and partly on the fiber. As might be expected, dyeings made in this manner have more tendency to crock than those produced by the two-bath method.

Fur Blacks and Browns

The various chemicals that are used to produce colors on furs are para phenylene diamine, para amido phenol, meta phenylene and many others. Para phenylene diamine is the most important as it is used for blacks. These chemicals are oxidized upon the fiber in order to produce the colored body. To give detailed instructions for the production of these colors on furs would be to change this article from a study of dyes to a study of fur dyeing and this cannot be done at this time.

Mineral Colors

Although not of great interest at the present time it will be well for the dyer to know these colors and how they are produced. Chrome yellow is the insoluble pigment produced by the interaction of a lead and chromium salt. The cotton fiber is first impregnated with the lead salt and is then passed through a chromium bath which produces a yellow. As might be expected from the lead present this color has poisonous tendencies.

Iron buff, also known as khaki, is the shade produced by the interaction of certain chromium and iron salts with caustic soda, and, therefore, it is a mixture of the oxides of iron and chromium. The color is very fast and has been extensively used for army goods, particularly by the British government.

There are, no doubt, many interesting dyestuffs which have not been mentioned in this series of articles, but to go into detail with every color would mean a volume of about eight hundred pages and even this would not cover the whole process of dyeing. When one considers that there is practically an unlimited number of possible dyestuffs of the coal tar class, and that new ones are being discovered every day, he is able to realize that to master the dyeing industry is not a matter of a few years but of a life time. While I realize that there are many things in this series of articles which will not be of use to the garment dyer in his daily work, still I believe they will stimulate interest and cause more study to be given to the dyestuffs in daily use, thus tending to improve the dyer's work.

The Barrett Manufacturing Company, Philadelphia, Pa., has awarded a contract for the construction of a new chemical distillation building, two-story reinforced concrete and brick, about 90 x 110 feet, at Bermuda and Market Streets.

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No Dyes Absolutely Fast to Light

Dyeing of Women's Dress Goods

DISCUSSED BY DR. LOUIS J. MATOS

THE question of fastness to light of the dyes used in women's dress goods was recently discussed by Dr. Louis J. Matos, of the National Aniline & Chemical Co., Inc., in an interview appearing in *Women's Wear.*

According to Dr. Matos no dyes have ever been produced which were absolutely fast to light and weather. Fastness is purely a relative term, and although many colors are available which will, so far as the eye can distinguish, outlast the fabrics themselves, there is, nevertheless, an invisible weakening of the color.

Speaking of the dyeing of dress fabrics and the colors available for this purpose, Dr Matos said:

Women's dress goods are made of two classes of fabrics. The most important and better quality are made from worsted yarns containing no admixture of either cotton or shoddy. The cheaper grades are made of worsted yarns that may contain either a variable quantity of cotton spun with the wool or they may be woven from worsted yarns and cotton yarns. In either case the fabrics may be regarded as being union goods.

Prior to the outbreak of the war, manufacturers of women's dress goods produced a wide range of shades divided principally into three groups:

First—Blacks of which there are a number of hues.

Second—Blues, from the deep blue black, through navies and lighter tones.

Third—Mode shades, or so-called fashionable shades, which comprise a variety of hues or tints manufactured to meet the whims of fashion.

The blacks and blues are usually regarded by manufacturers or jobbers of women's wear as staples. The mode shades are generally manufactured in quantities sufficient to meet the orders passed to the mills from the jobbers, to fill the requirements of the dressmakers and dress goods establishments in closest touch with the buying public who know better than any other class of dealer how the fashionable shades run.

FEW FAST TO LIGHT

As a general rule the dyes most commonly used prior to the war for the all-wool dress goods—that is, those of the better class and higher grades—were the level dyeing acid colors, a rather extensive range which in the hands of the dyer are capable of pro-

ducing every possible shade and hue. Of all the dyes available for this work there are few that possess the property of extreme fastness to light, which after all is the requirement now most insistently made. The number of level dyeing acid colors formerly foreign made possessing this particular quality may possibly number one-half dozen, not including black. With this small number the dyer is able to produce many combinations of great utility.

At the present time two of these important and much desired dyes have not been produced in this country—a blue and a violet are of importance as toning or shading colors for a wide variety of browns, tans taupes, etc. Take, for example, these several important shades shown in the 1917 and 1918 cards of the Textile Color Card Association: Chinchilla, mole, moleskin, beaverfelt, all shades belonging to one family and ranging from browns to grays; also the fashionable shades known as cub, bear, and rodent. These are all compound shades in which blue and violet are important components, as are also the two widely used and important shades, beaver and taupe.

It is necessary, however, that colors used in compounds should possess the same general properties, consequently the absence of this blue and violet possessing the same degree of fastness as the other colors now available occasions an embarrassment.

The reason for the inability of the dyemaker to produce these two colors is that some of the raw materials or so-called intermediates necessary for their production have not been developed. It is, however, only a question of time until these two most desired dyes will be available to the American dyer. The National Aniline and Chemical Co., Inc., is applying its great resources to their production, and it is to be expected that the near future will have something of interest in this direction.

No Dye Absolutely Fast to Light

Regarding the fastness of a dye, it should be remembered that there is no dye which is absolutely fast to light. In time, any dyeing when exposed to the combined influence of light and weather, will gradually weaken from the original shade as dyed. On the other hand, fastness is a relative term. One dye may be capable of resisting the combined influence of light and weather in comparison with another dye of the same shade, but not possessing the same properties, and this holds good for very many dyes of the level dyeing group.

It therefore becomes a matter of great importance for the dyer to make his selection of colors, paying due regard to the properties of the dyes selected, so that the rate at which the dyes are influenced by exposure shall be the same for each dye used in the combination employed by the dyer. An instance can be cited: In dyeing a green, the combination might be made of a yellow and a blue; if the yellow succumbs to the influence of light at a more rapid rate than the blue, in time the green as originally dyed will appear bluer than the sample. On the other hand, should the blue used in the combination fade out more rapidly than the yellow, the

green may appear yellower than the sample. In this case the dyer should choose a blue and a yellow that are influenced equally.

The important problem at the present time is to recognize the fact that a considerable number of the dyestuffs formerly imported from Germany and belonging to that group of dyes most commonly employed for dyeing women's dress goods have been duplicated by the dyemakers of the United States. These American dyes possess the same solubility, level dyeing, permanency under the influence of exposure and light, and such other properties as the imported dyes possess. These dyes, when properly selected according to the combinations necessary for producing the shade required, will, in the hands of a dyer familiar with the class of goods to be dyed, produce results identical with those formerly obtained when the imported dyes were obtainable.

Should Meet All Demands

With the line of colors of domestic manufacture now available, the mills should have no difficulty in satisfactorily meeting every demand made upon their dye houses for the usual lines of shades that can be readily produced and which do not require for their compounding the blue and the violet now in process of development. There is no question but the textile mills working on women's dress goods are in a position to turn out cloth dyed with a very wide range of shades that meet most requirements as to fastness that were made in those same mills and dyed with colors formerly imported from Germany. There seems to be no justification for any demand for a more explicit warranty than what is stated in the foregoing. If tests are made of cloth dyed in American mills, manufactured during the years preceding 1914, the same lack of fastness to light is apparent in a great number and regarding which but little complaint, if any, was made.

Chrome Ore Imports Restricted

In pursuance of the general policy of tonnage conservation, the War Trade Board has introduced restrictions upon the importation of chrome ore and chromite from overseas. The sources of home supply are numerous, and are believed to be capable of extensive development. To provide for interim demands pending the further development of such deposits, imports from Cuba, Guatemala, Newfoundland and Brazil by sea will be permitted, not exceeding 43,500 tons up to March 31, 1919, and from New Caledonia up to 10,000 tons prior to December 31, 1918. Shipments overland or by lake from Canada, overland from Mexico, or as return cargo from European ports when coming from convenient ports and not involving delays in loading, will be permitted. All outstanding licenses for the import of chrome ore and chromite for overseas have been revoked as to shipments made after June 15, 1918.

TREATMENT OF BURNS FROM CAUSTIC SODA

By M. Firsinger*

SOLID caustic soda and caustic soda liquor of even moderate strength, especially if hot, attacks clothing quickly, and attacks the flesh. Caustic soda is especially active in contact with the delicate structures of the eye or the interior of the mouth. For these reasons it is necessary to avoid its contact with the skin, and to adopt means for immediate treatment in case contact occurs.

For immediate first-aid treatment of caustic soda burns, dilute acetic acid is used. It is prepared from good quality commercial acetic acid by diluting it to an exact content of 2 per cent. actual acetic acid. If the commercial acetic acid be of 30 per cent. strength, one quart of it is added to fourteen quarts of water to give 2 per cent. strength. After this solution the acid is analyzed, to make sure that its strength is 2 per cent.

When an employee receives a caustic burn, this dilute acetic acid is applied immediately. It instantly neutralizes the caustic soda and converts it into harmless sodium acetate, and the injurious action of caustic upon the flesh or clothing is stopped. With serious burns application of dilute acetic acid is immediately followed by carron oil, which has a soothing effect. In case of eye burns, the eye is thoroughly washed with acetic acid, and then sweet oil is applied.

It is important that no absorbent cotton be used for cleansing the burn, because fibres of the cotton become imbedded in the wound. They interfere with the healing and present danger of infection.

In order to identify the dilute acetic acid as a first-aid material, a small amount of cochineal solution is added to color it red. In general, the handling of soda ash or sodium bicarbonate present no accident risks, but caustic soda, either solid or liquid, must be guarded against. The best safeguard against all conditions of caustic soda burns is to have a supply of 2 per cent. acetic acid solution always at hand, in clean bottles, close to every place where caustic soda is handled.

With these precautions, and with workmen trained to use the acetic acid immediately, serious burns from caustic soda need rarely happen.

* From a paper read before the National Safety Convention, New York.

American Goods Wanted For Australian Market

Walter E. Bush, 109 Highland Ave., Jersey City, N. J., has recently been appointed United States buyer for one of the largest importing corporations in Australia.

If any of our readers are not now represented in that market and if your goods are manufactured by and your firm is composed of non-enemy aliens, it is possible that a certain amount of business might be secured for that field, which at this time is more than ever looking for goods of American manufacture, by corresponding with Mr. Bush.

The Western Dry Color Company, 608 West Fifty-second Street, Chicago, Ill., has awarded a contract for the construction of a new two-story addition to its plant, about 45x60 feet. Rawley Brothers, 810 West Sixty-third Street, Chicago, are the contractors.

The U. S. Color & Chemical Company, 15 Custom House Street, Boston, Mass., is having plans prepared for the construction of a new one-story addition to its plant at Ashland. The structure will be about 50 x 80 feet.

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DEXTER W. HEWITT, President
A. P. HOWES, Vice-President
ELISHA HEWITT, Sec'y-Treas.

United States Leads in Exports

According to figures prepared by the National City Bank of New York, America now occupies first place among the export nations of the world. Prior to the war first place was held by Great Britain and second by Germany but since the suspension of Germany's export trade the United States has, until the present time, occupied second place to Great Britain. The last figures, however, placed us well in the lead.

Among the exports which are mentioned are those of dyes and dyestuffs, the total value of which for the fiscal year ending June 30, 1914 was $357,000; in 1915, $1,178,000; in 1916, $5,012,000, and for the calendar year, 1917, $16,107,000.

This tremendous growth in our dyestuff industry holds great promise for what may be expected when our infant industry acquires its full growth.

Color Importers Organize

Importers of colors and dyestuffs have formed an organization to protect their interests in tariff matters. Walter F. Sykes, of Walter F. Sykes & Co., of this city, president of the association, declined to discuss the matter further than to admit that such an association had been formed.

It is understood that the organization will take in many of the largest color and dyestuff importing houses in the United States. The chief purpose of the association, it is said, is for the protection of the importers at the close of the war in view of the present agitation for further increases in the tariff rates on dyes and the plans of the American manufacturers to hold on to the new business they have obtained.

Among the firms reported as interested in the organization are; A. Klipstein & Co., Walter F. Sykes & Co., Geigy & Co., of New York City; Atteaux & Co., of Boston, and Fortner & Co., of Philadelphia.

The name of the organization is United States Dyestuff and Chemical Association. Officers elected are Walter F. Sykes, president; P. R. MacKinney, New York Color and Chemical Co., N. G. Wattes, of Andrey Kovicz & Dunk, Philadelphia, and E. C. Klipstein, New York, vice-presidents. W. F. Zipse, Geigy Company, New York, secretary.

Amendments to Dyestuff Tariff

The Tariff Commission has sent to the House, a report on the investigation recently made into the dyestuff situation and suggested several amendments to the law. A bill will be introduced at this session covering the chief points suggested by the Commission. One suggestion deals with concentrated dyes and if adopted will prevent the importation of products which are stronger than the commercial standard and which heretofore have escaped paying duty in proportion to the value. Dyes were imported from Germany before the war in this concentrated form and then diluted for commercial use. Other paragraphs in the law have been clarified and manufacturers believe the changes will prove of benefit to the industry after the war.

Du Ponts Take Over Plant at Lodi

It is reported that the United Piece Dye Works, of Lodi, N. J., has decided to discontinue the manufacture of dyestuffs, and that E. I. Du Pont de Nemours & Co., of Wilmington, Del., will take over that branch of the business. The making of dyes was undertaken by Albert Blum and Henry Blum, owners of the United Piece Dye Works, when the war cut off their supplies. They made many of the most expensive and rare dyes.

ALIZARINE RED NOW MADE IN AMERICA

IN January of this year, the National Aniline & Chemical Company, Inc., made this statement in its house organ "Dyestuffs": "The interesting things hoped for in 1918 are the placing on the market of alizarine red, of indigo, and of hydron blue. The consuming trade looks forward with expectancy to these accomplishments. Other things are hoped for, but these are promised." The development of synthetic indigo has already been announced both by the Du Ponts and the National Aniline Co. At the recent textile show in Grand Central Palace the National Company displayed two large globes, one filled with indigo and the other with alizarine. It now announces that alizarine is actually being placed in the hands of the consumers, the first shipments having already gone out.

Up until the beginning of the war the big alizarine industry was almost entirely German. It was in 1868 that two German chemists, Graebe and Lieberman, determined the constitution of the product and succeeded in manufacturing not only alizarine but also purpurine. Upon this investigation also depended a number of subsidiary processes of great importance: the manufacturing of bichromates and fuming sulphuric acid. The discovery of alizarine practically eliminated the entire madder industry, which flourished especially in France, and many hundreds of thousands of acres which had formerly served for the cultivation of madder were made available for foodstuffs. Madder has almost completely disappeared from the markets because it could no longer compete with alizarine in purity, strength, and especially uniformity in quality. There are still some dye houses in Europe which from force of habit prefer madder to alizarine, but it is universally conceded that, especially for the calico printer, alizarine produces results which were not possible with madder.

Alizarine, so named by Robiquet and Colin after "Alizari" the commercial name of levantine madder root, is a derivative of anthracene, which is contained in coal-tar. Anthracene is usually oxidized with sodium bichromate and sulphuric acid, and the resulting anthraquinone transformed into a sulphonic acid. The sulphonic acid is then melted with caustic soda and transformed into alizarine in closed vessels under pressure. The chemical name of Alizarine is dioxyanthraquinone. It is a reddish yellow powder in its pure state, or appears in brilliant orange red needles at the melting point of 289-290°. It is practically insoluble in cold and very little soluble in boiling water. It dis-

solves completely with a reddish orange color in boiling alcohol, ether, and carbon disulphide, glycerine, glacial acetic acid, benzol, and tupentine. Caustic soda dissolves it with a bluish violet shade. Muriatic acid precipitates the dyestuff from this solution.

Dyeings produced from alizarine are distinguished by great brilliancy and excellent fastness to light and washing. When applied to cotton in connection with aluminun mordants, the so called Turkey Red, the fastest red known to the art of dyeing, is produced. It is for this Turkey Red that alizarine has been needed most.

The alizarine of the National Aniline & Chemical Company, Inc., has been developed in the laboratory of its Brooklyn Works, where, we are told, it is now being manufactured in a building erected for this purpose. This achievement, with that of indigo, does much to show the falsity in the position of those consumers who still doubt the ability of the American chemist and manufacturer to equal the product of the German, and to continue to supply the American consumer after the war. This American alizarine is, we understand, of exactly the same quality in all respects as that formerly imported from Germany. It is now expected that the development of hydron blue, a fast blue for cotton, which is likely to follow, will meet the last objections of the remaining doubters.

Olney Chemical Alumnae Outing

The tenth annual outing of the Olney Chemical Alumnae of the Lowell Textile School, Evening Course, was held at Johnny Cake Inn, Billerica, Mass., June 8, 1918.

During the afternoon field sports were indulged in and in the evening dinner was served. Following the dinner many interesting speeches were delivered.

Following are the officers for the coming year:—Samuel J. Nichol, President; Jas. H. Spurr, Vice-President; Alex. T. Herron, Secretary and Treasurer.

Dunker & Perkins, Boston, Mass., dealers in dyestuffs and soaps, have incorporated under the laws of Massachusetts, and will continue the business under the firm name of Dunker & Perkins Company, with Charles H. Dunker as President; Frank Watson as Vice-President, and Eugene C. Perkins as Treasurer. The new firm will handle in New England the products of Federal Dyestuff & Chemical Corp., Kingsport, Tenn.; Imperial Color Works, Glens Falls, N. Y.; Imperial Dyewood Co., Glens Falls, N. Y.; Herrick & Voigt, New York, N. Y.; Fisk Manufacturing Co., Springfield, Mass.

The Uncolored Story of American Dyes

By John Walker Harrington

Editor's Note: *The following article appeared recently in the Evening Post Magazine—While in no sense technical it gives a very fair idea of what American Manufacturers have accomplished and the remarks in regard to dye testing should prove decidedly interesting to readers of the* Reporter.

THE uncolored story of American dyes has about 250 shades, as compared with the 900 of the German chemical saga. The most convincing presentation of what American manufacturers of dyestuffs have accomplished since August, 1914 was given in the Sixth National Textile Exhibition, which was held recently at the Grand Central Palace. Not all of the 130 dye-makers of the United States were represented in the booths and stalls, but there were enough of them to show that the industry has made gigantic strides. Any trade would indeed require seven-league boots to overtake in forty months what it took Germany forty years to develop.

The first thing which the Teutonic manufacturers of the aniline colors did was to emulate the humble squid and to darken the waters of competition with the inky blackness of propaganda. They declared by indirection and also by good set terms that no dyes could really have color or enduring qualities unless they came from factories beyond the Rhine. The German dye industry is built up, or rather was before it went into munitions, upon a series of interlocking directorates. The seven leading companies co-operated in such a way by an exchange of by-products and residues that they could crowd most manufacturers out of a place in the sun.

As a matter of fact, the dyes which are being made in this country are, taking a general average, just as good for the specific purposes for which they were intended as any colors ever dumped from a German submarine. Much of the dissatisfaction registered on the faces of American womankind concerning our native dyes has not been due to the products themselves, but to the fact that the dyes are often applied to uses for which they were not intended. A vigorous complaint, made only a few months ago, concerning some goods which had faded was well justified, because, although the color used had the distinction of being brought here on the underseas freighter *Deutschland,* it was never intended for silk, but for wool. The manufacturer, in order to save money on the cost of the fabric, had employed a cheap dye, which proved unsatisfactory, despite its highborn German pedigree.

The American dyestuff industry has come up out of great tribulation. Before the beginning of the European war the making of dyestuffs in this country consisted largely of finishing off partly completed products of Germany and Switzerland. The material, coal tar, which is the mother of so many hundreds of aniline dyes, was conserved in Europe and thrown away in the United States. In these days it seems like a bad dream that America was once sunk in such economic sin that she squandered all the volatile constituents of coal in the manufacture of coke. She was burning down houses in order to roast her pigs. The demand for coal tar brought about by the war caused the United States to tear down the old type beehive ovens and to substitute for them the by-product ovens which conserved the black liquids in which are concealed the most potent means for promoting "battle, murder, and sudden death."

The Coal-Tar "Family Tree"

FROM the dark and viscid coal-tar are derived what the industrial chemists call the "primary crudes," such as benzol, toluol, xyol, naphthalene, and anthracene. From these main

branches of the family tree of coal-tar sprout many scions. They in turn have their various twigs, known as the intermediates, which rejoice in unpronounceable and sesquipedalian titles. From the intermediate twigs bloom strange flowers and flourish particolored leaves. By the wizardry of modern chemistry all the colors of the spectrum may be derived from any one of these primary branches of the tree. The dyes, however, differ in quality and adaptability. The manufacturer would like to develop the toluol branch as much as possible, but toluol is the main ingredient of the powerful war explosive, trinitrotoluol, called for short T. N. T. The Government needs all the T. N. T. it can get these days, and as the product which formerly sold at thirty-two cents a gallon is now quoted from $4.50 to $5 a gallon, the American dye manufacturer cannot plunge very heavily in the direction of toluol. He therefore does the best he can with the next branch, benzol, which is much cheaper, and more available.

The hundreds of dyes which spring from the coal-tar trunk vary in quality and properties. Some are good for coloring wool and others are suited for silk or cotton. Sometimes manufacturers of textiles have been so pressed for time and material that they are not able to maintain all these fine distinctions. As, however, a dye is a chemical, and its formula is identical no matter where it is produced, there is really no difference between a German dye and an American dye, any more than there is any variation of Syracuse salt from the salt of Silesia.

One of the most interesting displays at the Textile Exhibition was a series of samples of cloth, half of which were dyed with anilines made in Buffalo, N. Y., and the remainder with dyes made in Germany. The fabrics had both been exposed to air and light and weather under the same conditions. The manufacturers who studied them with most critical eyes and with a view to using them in their own color vats could see no appreciable difference in most cases. In some instances the American product met the tests better than the one of

Teutonic manufacture. It is true that here the whole range of the spectrum could not be found, and yet there were scores of good practical shades to be obtained. There were even some very bright and alluring tints, such as Niagara blue and Erie green. In long rows of glazed porcelain pots kept hot on a steam table were solutions of dyestuffs in which a laboratory assistant was constantly dipping skeins of yarn. There the German and the American pigments were side by side, and there was no question that the product of the United States excelled that of Germany, in the red division.

There could be seen in the cream-colored beakers solutions of brilliant scarlet, the reddish allurement, azo rubine; crimson, fuchsine, croceine, scarlet, xylidine scarlet, and cloth red. On parade were various shades of orange denominated croceine and crystal, the yellow of metanil and resorcine, a fast blue, an induline of deep cerulean tinge, and a cynanone of the hue of an Egyptian night.

Among the acid colors put on view were resorcine browns, fast violets, and half a score of blacks. Dyes of this groups are used primarily for wool, and are employed in an acidified bath. Some of them are utilized for many other purposes, such as wood staining, the tinting of paper, and especially in the manufacture of carpets and rugs. Many are available for the finest kind of silk dyeing.

Delicate Shades Lacking

IT was not so long ago that the manufacturers of floor textiles hoisted a signal of distress because they could not get enough dyes to keep their mills busy. One large corporation which employs several thousand men in its Yonkers plant had by remarkable foresight accumulated a year's supply of German dyes before the beginning of the European war. In days like these, however, the carpet and rug manufacturers can obtain any shade they need for their vats.

The members of the group of direct colors used principally for dyeing unmordanted cotton are especially represented. Some of this division have the valuable property of imparting fast color to both wool and cotton, and therefore they are of great importance for dyeing fabrics in which both of these fibres are combined. In this class were seen garnet reds, chloramine yellows, and widely varying shades of green, blue, violet, and brown.

In the dyeing of clothes for men all the principal difficulties have been overcome. The khaki and the olive drab of the army uniforms, the browns and grays and tans employed in the cloth used for civilian garb, are now to be had in abundance. It is true that the business suits of men disport much less those threads of bright, light blues

and greens and violets which were formerly used to lighten the more sombre effects.

The greatest difficulty which the dye manufacturer has had to face is the production of just these light and attractive hues of violet, blue, and green, for, by reason of some contrariety innate in the eternal feminine, women want these shades at this season. They simply must have their Copenhagen blue, reseda green, their Irish emeralds, wistaria, and all manner of pale violet tones, as well as the more startling ones. Many women are wearing dark blues, which may be had in abundance, but they are not happy in them. The manufacturer is producing the various alizarine colors in fair quantities, but he has not yet been able to reach the limit of the demand for horizon blue, nor can he furnish as much as he would of the rosy glow of the dawn of a perfect day. He has, however, been doing his full duty by Kelly green, although he has to charge nine dollars a pound for it instead of sixty-five cents a pound, which was the price before the war.

Occasionally, women customers complain that their silks of light and brilliant colors are fading or that the colors run. This is not necessarily the fault of the dye-maker. Even before the war there were colors which could not be guaranteed not to crock or fade. The American color makers have been especially successful in the production of fast blacks for hosiery, which they are placing on the market at prices within the reach of all.

"The black dyes used in this country for the coloring of hosiery," said Dr. Matos, in charge of the exhibit of the National Aniline Chemical Company, Inc., at the textile show, "are as good as may be found anywhere else in the world. We must remember, however, that before the war we were wearing large quantities of imported socks and stockings in this country. The dyeing of black hosiery is a more or less complicated art, as the color is made in the fibre during the process of manufacture, and particles of the unattached dye must be removed. Orders for black socks and stockings were cascaded upon the mills, and the hosiery manufacturers found difficulty at first in getting out their product. Dyers were teased and harassed and worried to hurry up at all stages of the process. In those days the skimping of time in finishing up the product resulted in the making of hosiery from which the color would come out in washing or crock off on the feet. All the good quality black lisle or cotton hosiery is dyed with aniline, and we can challenge the world on the quality of this product.

Testing Dyes

THE shortage of certain grades of material from which fabrics are made has made variations in color, irrespective of the dyestuffs employed. It is difficult, for instance, to get certain grades of long-fibred wools, and even in the making of cloth for military uniforms the Government permits the use of a limited amount of shoddy. Shoddy, being composed of very short fibres of wool obtained by the picking

to pieces of old woollen clothing or wool rags, has filaments from three-quarters to an inch in length. The weaving of it into any fabric detracts from the finish and durability, and also affects the uniformity of color.

The remarkable progress made in the manufacture of dyestuffs in the last two or three years has developed the methods for the testing of the substances used in coloring the textiles. There are now many laboratories which are devoted to solving the problems of the dyer and checking up his work. The examination of the effects of this coloring matter upon the fabric is becoming more and more of an exact science. The fabrics are scrutinized under ultra-violet rays and under daylight lamps. Also, they are subjected to the microscope so that, if crystals of the chemicals are detected clinging to the threads, a fault in the dyeing process may be corrected. The colored fabrics are dipped in dilute acids or in alkali solutions so that their fastness may be determined. The strength of dyes is accurately measured in an apparatus known as a colorimeter, in which solutions of the dye placed between the observer and the light are studied through an eyepiece. Before a manufacturer colors thousands of yards of a valuable fabric, he must know precisely whether the dye to be used will match that which had been employed on other goods. No matter how much confidence he may have in the skill of the master dyer, he insists also upon having the shade checked up by the scientists.

"American dye manufacture," said Dr. Edward Wallace Pierce, chief chemist of the United States Conditioning and Testing Company, "has made great progress. It is handicapped somewhat by the fact that American capital demands quick returns on its investments. The Germans in building up their enormous dye industry were very thorough and very patient. They expended millions of dollars, for instance, in the experiments which resulted in the making of synthetic or artificial indigo from coal-tar. The originator of the process worked eighteen years before he produced the substitute for the natural plant. When the capitalists interested told him that he ought to make it from a more abundant base than toluol in order to have it a commercial success, he went back to the laboratory for ten years more, and finally produced the substance from naphthaline.

"There is no difficulty in producing dyestuffs of purity and strength in small quantities under laboratory conditions. When, however, thousands of tons of material must be handled at once, numerous complications arise. Impurities appear in the product. Methods must be devised for removing them. A large New York company with which I was formerly connected spent $90,000 before it produced 1,000 pounds of a certain dye which fulfilled all the requirements of large-scale manufacture. The various reactions in the factories require certain lengths of time. For example, it is thirty-three days from coal-tar to the H acid which is used as a basis for many of our important colors. American makers have abundant scientific knowledge, and they are rapidly acquiring practical experience. There are several important discoveries almost ready for announcement which will show they have developed originality and initiative in methods."

Those who are intimately connected with the secrets of the native dye industry believe that within the next ten years it will be a tremendous factor, not only in this country, but in the world.

The National Aniline & Chemical Co., Buffalo, N. Y., will construct a three-story brick and steel machine shop to cost $85,000. This building will use 100 tons of structural steel. The same company soon will ask for bids on an eight-story warehouse.

NATIONAL ANILINE COMPANY OPENS NEW BUILDING

THE National Aniline & Chemical Co., Inc., formally opened their new building at 21 Burling Slip, New York, on the afternoon of Tuesday, June 18th. On behalf of the board of directors invitations to inspect the building at that time were sent to the various friends of the Company throughout the dyestuff and allied industries. Those who embraced this opportunity were conducted through what is undoubtedly the handsomest and most complete building devoted to the commercial side of the dyestuff industry in America.

The building itself is ten stories in height and is occupied exclusively by various departments of the National Aniline & Chemical Co. There is in all a total of 25,000 square feet of available store space. The first two floors are occupied by the bookkeeping and accounting departments: on the third floor are located the offices of the managers of the drug, gum and essential oils departments: the fourth floor is given over to the export, statistics and insurance departments; on the fifth floor are the offices of both the domestic and export sales departments: the sixth floor is occupied by the correspondence department: and on the seventh floor are the department of publicity, filing rooms and the library. In connection with the latter it might be said that there is here collected one of the most complete libraries of works pertaining to the dyestuff industry which is available in America to-day; in addition to numberless volumes on different phases of the industry in both English and foreign languages there are also complete files of various technical journals, all of which are accessible to the general public for reference reading. The eighth floor is given over to the purchasing department and the Board room: on the ninth floor are the executive offices; while the tenth floor is taken up by an exceptionally well equipped laboratory where all colors are tested under the supervision of the technical director before delivery, even though they may have been previously tested at the laboratories of the various plants.

After being permitted to inspect the building the guests were entertained on the roof, where light refreshments were served and whence a remarkably fine view of the harbor and lower city could be had.

Among the more prominent of the guests present were: Jerome A. King, of J. B. King & Co.; W. D. Wood ,of the Corn Products Refining Co.; H. L. Griggs, of the Bank of New York; W. H. Childs, W. N. McIlravy and T. M. Rianhardt, of the Barrett Co.; Wm. J. Matheson (President of the National Aniline & Chemical Co., Inc.); Jas. L. Morgan, Lancaster Morgan, Wm. H. Nichols, W. H. Nichols, Jr., W. C. Nichols, Chas. R. Smith, Sanford H. Steele, Henry Wigglesworth, of the General Chemical Co.; Frank L. Sniffen, of the Title Guaranty & Trust Co.; John H. Peters, of the National Lead Co.; and Geo. N. Bessett, of Burlington, Vt.

DYER'S RIGHT TO LIEN

IN the recent case of L. Hecht & Co. vs. Valkone Dye and Finishing Works, 66 Pennsylvania Superior Court Reports, 97, the plaintiff was sustained in a suit to replevy certain materials held by the defendant under a lien claim.

The plaintiff was in the habit of sending raw yarn to a company in Providence to be manufactured into woolen goods and then sent to a dyeing and finishing company for the plaintiff. Certain materials were sent to the defendant by the Providence company under this agreement. That company being indebted to the defendant the latter refused to perform the work or to surrender the goods until paid an amount due from the former for work previously done under a general agreement that all goods received by the defendant should be subject to lien for any balance due from the Providence company for other work. Finding that the plaintiff was not charged with knowledge that a general lien agreement existed between the Providence company and the defendant, the court decided that no lien could be enforced as against the plaintiff, the owner of the goods. The court said:

"There seems to be no doubt that a general lien for work done on previous goods sent by the owner will be sustained in law against goods subsequently sent by the owner, though no work had been done on these goods: Firth & Foster Bros. v. Hammill, 167 Pa. 382. In that case the transaction was between the immediate parties. In the case at bar a third party intervenes, who received the goods from the owner, and transmits them to the company claiming the lien. To subject the owner's property to this lien, there should be such action on his part as would show assent, or through the equities of the case stop him from denying the workman's right of lien."—*National Cleaner & Dyer.*

METH-O-LENE PLANT FOR SALE

The Meth-o-lene Company has discontinued the manufacture of Aniline Colors, due to the impossibility of procuring certain raw materials which they require. The Company, however, is taking care of its customers through their Agents, Binney & Smith Co.

It is understood that their large and well equipped factory located near Easton, Penn., is now for sale. It is not likely that they will resume the manufacture of Aniline Colors unless the chemical market shows a radical change. It is possible that the plant will be re-equipped to produce some other product.

SWISS PROFITS IN DYESTUFFS

The Sandoz Chemical Works Company, Basle, which is among the leading Swiss manufacturers of coal tar colors, is paying a dividend of 25 per cent. and a bonus of 100 per cent. The Society for Chemical Industry, Basle, the largest of the Swiss dyestuff firms, for whom A. Klipstein & Co. are American agents, shows a net profit of £409,000 for the half year, as against £504,000 for the previous year, and is paying a dividend of 12½ per cent. as against 25 per cent. and a bonus of 25 per cent. last year, and is also giving the shareholders one new share for every four shares now held. Before the war the average profit was about £200,000 and the dividend 16 per cent.